AI Scavenger Hunt

Discover Artificial Intelligence in Your Everyday Life • Ages 10 to 15

Student Name: _____ **Date:** _____

Class / Group: _____ **Teacher:** _____

Your Mission

Artificial Intelligence (AI) is technology that allows computers to perform tasks that normally require human intelligence, such as understanding speech, recognising faces, making recommendations, and learning from experience. AI is all around you, often working behind the scenes in the apps, devices, and services you use every single day.

Your mission is to become an **AI Detective**: over the next **24 to 48 hours**, find as many examples of AI as you can in your daily life. For each item you discover, tick the box, write down what you found, and answer the guiding question. You can do this at home, at school, or out and about.

How scoring works: Each AI example you find earns you points. Different categories have different point values. At the end, tally your total and discover your AI Detective rank!

What Counts as AI?

Before you start hunting, let's clarify the difference between a **regular computer program** and an **AI system**:

- A **regular program** follows strict, pre-written rules. It does the exact same thing every time. Think of a calculator: 2 + 2 always equals 4. The programmer wrote every instruction in advance.
- An **AI system** *learns from data* and can adapt. It might improve over time, make predictions about things it hasn't seen before, or handle tasks it wasn't explicitly programmed for. The programmer creates the learning process, and the AI figures out the patterns.

Uses AI	Does NOT Use AI

Siri answering “What’s the weather?”: uses **Natural Language Processing** (NLP) to *understand* your voice and machine learning to form a response	A microwave heating food for 2 minutes: follows a simple timer circuit with no learning
YouTube recommending videos: *learns* your preferences from watch history, likes, and what millions of similar users enjoy	A calculator computing 156 × 23: follows fixed arithmetic rules, no adaptation
Google Maps finding the fastest route: *predicts* traffic patterns using real-time data from millions of phones on the road	An alarm clock ringing at 7:00 AM: a simple scheduled trigger, no intelligence
Face ID unlocking your phone: *recognises* your unique 3D face geometry using a neural network	A light switch turning on a lamp: a basic electrical circuit, nothing to learn
Spotify Discover Weekly: *analyses* your listening habits + millions of other users to predict songs you’ll like	A CD player playing tracks in order: reads data sequentially, no intelligence needed
Google Translate converting a paragraph: uses **neural machine translation** to understand sentence meaning, not just word-by-word substitution	A printed phrasebook for tourists: static content created by a human author, never updates

Quick test: Ask yourself: *“Does this system learn from data, adapt, or make predictions?”* If yes, it’s probably AI. If it just follows the same fixed rules every time, it’s a regular program.

Category 1: In Your Home

Your home is full of AI! Smart speakers, streaming services, and even some kitchen appliances use AI to make your life easier. Look carefully; you might be surprised how much AI is working quietly in the background. **(10 points per item | max 50 points)**

■ Voice Assistant (Siri, Alexa, Google Assistant, Bixby)

*Voice assistants use **Automatic Speech Recognition (ASR)** to convert your spoken words into text. This uses deep neural networks trained on over **600,000 hours** of human speech. Then, **Natural Language Understanding (NLU)** figures out what you actually mean. Finally, a **text-to-speech (TTS)** system generates the spoken response. Amazon's Alexa processes your voice in the cloud, analysing it against acoustic models and language models in milliseconds. Modern assistants also use **wake word detection**, a small on-device neural network that listens specifically for "Hey Siri" or "Alexa" without sending any other audio to the cloud.*

What did you ask it? Did it understand you correctly? Try asking something tricky, like a question with two meanings.

■ Video/Music Recommendations (YouTube, Netflix, Spotify, Apple Music)

*Recommendation engines are among the most commercially valuable AI applications. **Netflix's AI** analyses what you watch, when you pause, what you skip, how you rate content, and what **75 million** other subscribers with similar tastes enjoy. It considers over **1,300 recommendation clusters**. Netflix estimates its recommendation system saves the company **$1 billion per year** by reducing cancellations. **Spotify's Discover Weekly** uses **collaborative filtering** (comparing your habits with millions of other users) and **content-based filtering** (analysing audio features such as tempo, key, energy, danceability, using convolutional neural networks). YouTube's recommendation algorithm drives **70% of all watch time** on the platform.*

Look at your recommendation feed now. Why do you think each item was suggested? Was anything surprisingly accurate?

■ Smart Home Devices (Robot vacuum, smart thermostat, smart lights)

*Robot vacuums like **iRobot Roomba** use **SLAM (Simultaneous Localisation and Mapping)** where the robot builds a map of your home in real-time while navigating around furniture, pets, and obstacles. It uses LIDAR sensors or cameras to create a detailed floor plan, then plans the most efficient cleaning route. **Google Nest thermostats** use machine learning to study your temperature preferences, daily schedule, local weather, and building insulation characteristics, then automatically adjust heating/cooling. Google claims Nest saves homeowners an average of **10 to 12% on heating** and **15% on cooling bills**. Some Samsung smart fridges use computer vision to identify what food is inside and suggest recipes.*

Which smart device did you find? How does it behave differently from a non-smart version? What data does it collect?

■ Smart TV Features (Voice search, recommendations, image upscaling)

*Modern smart TVs have dedicated **AI processing chips**. Samsung's "Neural Quantum Processor" uses machine learning to upscale lower-resolution content to near-4K quality in real time. The AI analyses each frame and fills in missing detail based on patterns learned from millions of images. Voice-controlled remotes use the same speech recognition as voice assistants. Content recommendations on your smart TV's home screen use viewing history, time of day, and collaborative filtering to predict what you'll want to watch.*

Does your TV recommend content? Try its voice search. How well does it understand you?

■ Email Spam Filter (Gmail, Outlook, Yahoo Mail)

Gmail's spam filter *uses multiple layers of machine learning, trained on signals from* ***billions of emails****, to achieve* ***over 99.9% accuracy****. It analyses hundreds of features per email: sender reputation, header information, text patterns, embedded URLs, attachment types, and even invisible tracking pixels. Gmail also uses AI to categorise your inbox into Primary, Social, Promotions, and Updates tabs. Google's* ***Smart Reply*** *feature generates short response suggestions using* ***sequence-to-sequence neural networks****. About* ***10% of all Gmail replies*** *now use Smart Reply.*

Check your spam folder. How many emails did AI catch? Did it ever put a real email in spam by mistake?

Category 1 Score: _____ / 50

Category 2: On Your Phone & In Your Apps

Your smartphone is arguably the most AI-packed device you own. From the moment you unlock it to the last notification you receive at night, AI is working constantly. **(10 points per item | max 60 points)**

■ Autocomplete & Predictive Text (Keyboard suggestions)

*When your phone suggests the next word as you type, that's a **language model**, a type of AI trained on massive amounts of text. Apple's **QuickType** and Google's **Gboard** use on-device machine learning that runs entirely on your phone (so your keystrokes stay private). These models learn your personal writing style, including your favourite words, phrases, and even emoji patterns, and adapt over time. The technology is related to the same transformer architecture that powers ChatGPT, but scaled down to run on a mobile chip.*

Let autocomplete finish a whole sentence for you. Does it sound like you? Try starting with "I really think that..."

■ Photo Filters & Face Detection (Snapchat, Instagram, TikTok)

***Augmented Reality (AR)** filters use **computer vision** AI to detect your face in real-time. The AI identifies up to **468 facial landmark points** (eyes, nose, mouth, jawline, eyebrows, forehead) and tracks their movement at **30+ frames per second**. Snapchat's Lenses use a combination of **convolutional neural networks (CNNs)** for face detection and **deformable face models** for accurate tracking. TikTok's **For You Page** algorithm analyses watch time, replays, shares, comments, follows, and even the video's content itself using computer vision to identify objects and scenes.*

Use a face filter and move your head quickly. What happens? Try covering part of your face. Does it still work?

■ Game Character AI (NPCs: Non-Player Characters)

*Every video game with computer-controlled characters uses AI. In **Minecraft**, mobs use **pathfinding algorithms** (like A* search) to navigate around obstacles. In **FIFA** and **NBA 2K**, opposing players use **finite state machines** and **behaviour trees** to decide when to pass, shoot, or defend. Games like **The Last of Us Part II** feature AI that adapts to your play style, where enemies coordinate attacks, flank, and change tactics. Racing games like **Forza Motorsport** use "Drivatars", AI trained on actual player driving data, so each AI racer drives like a real person.*

Play a game with AI characters. How do they react when you do something unexpected? Do they seem smart or predictable?

■ Face ID / Fingerprint Unlock (Biometric Security)

*Apple's **Face ID** uses a **TrueDepth camera** that projects over **30,000 invisible infrared dots** onto your face, creating a precise 3D depth map. A dedicated **Neural Engine** compares this map against the stored model. The probability of a random person unlocking your phone is approximately **1 in 1,000,000** (vs 1 in 50,000 for Touch ID). Face ID works in complete darkness (infrared, not visible light), adapts as your appearance changes (growing a beard, new glasses, ageing), and processes everything on-device. Your face data never leaves your phone.*

Try unlocking your phone with sunglasses, a hat, or in the dark. Does it still work? Why might it sometimes fail?

■ Photo Organisation (Google Photos, Apple Photos)

***Google Photos** and **Apple Photos** use multiple AI models: **image classification** (identifying objects such as dogs, sunsets, food, beaches), **facial recognition** (grouping photos by person even as they age), **scene detection** (recognising "concert" or "wedding"), and **OCR** (reading text in photos so you can search for a receipt by shop name). Google Photos lets you search "dog at the beach" and finds matching photos you never labelled. Apple's on-device AI*

*identifies over **4,000 categories** of objects and scenes.*

Open your photos app and search for an object (“cat”, “food”, “car”). Did it find the right photos? Any mistakes?

■ Map Navigation & Traffic Prediction (Google Maps, Waze, Apple Maps)

*Navigation apps use AI in multiple ways. **Route optimisation:** algorithms evaluate thousands of possible routes in milliseconds. **Traffic prediction:** Google Maps analyses real-time GPS data from approximately **1 billion** active users, combined with historical patterns, to predict congestion up to an hour ahead. **ETA estimation:** ML models trained on billions of past trips predict arrival times within **a few minutes** accuracy. **Waze** adds crowdsourced reports and uses AI to verify them against traffic flow. Google Maps uses **DeepMind AI** to improve ETA accuracy by up to **50%** in some cities.*

Use navigation for a journey. How accurate was the ETA? Did it reroute you to avoid traffic?

Category 2 Score: _____ / 60

Category 3: At School & While Studying

AI is increasingly woven into education, from writing tools and translation to adaptive learning platforms. **(10 points per item | max 50 points)**

■ Spell Check & Grammar Check (Google Docs, Word, Grammarly)

Modern writing assistants go far beyond dictionary lookups. ***Grammarly*** *uses* ***deep learning NLP models*** *trained on billions of sentences to detect over* ***400 types of errors*** *including basic typos, dangling modifiers, passive voice overuse, and inconsistent verb tenses.* ***Microsoft Editor*** *uses transformer-based AI to suggest rewrites for clarity.* ***Google Docs*** *grammar suggestions are powered by neural networks trained on millions of professionally-written documents. These tools understand context. They know that "there", "their", and "they're" all sound the same but mean different things. About* ***30 million people*** *use Grammarly daily.*

Write a paragraph with 3 to 4 deliberate mistakes. How many did the AI catch? Did it suggest anything wrong?

■ Search Engines (Google, Bing, DuckDuckGo)

Google processes over ***8.5 billion searches per day*** *(about 99,000 per second). Since 2019, Google has used* ***BERT*** *(a 340-million-parameter neural network) to understand the meaning of queries, not just keywords. In 2021, Google added* ***MUM (Multitask Unified Model)****, which is* ***1,000x more powerful than BERT*** *and understands information across 75 languages. When you search "can I use tips from bank of America to pay for a flight with United?" Google understands "tips" means reward points, not gratuity.*

Search for something ambiguous (like "Apple" or "Python"). How does Google decide what to show?

■ Adaptive Learning Platforms (Duolingo, Khan Academy, Quizlet)

Duolingo *uses* ***Half-Life Regression (HLR)*** *to predict exactly when you're about to forget a word, then shows it at precisely the right moment, a technique called* ***spaced repetition****. It has* ***over 500 million registered users****.* ***Khan Academy*** *adapts problem difficulty based on your performance and recently introduced* ***Khanmigo****, a GPT-4 powered AI tutor that guides students using the Socratic method.* ***Quizlet*** *uses AI to identify which flashcards you haven't mastered and prioritises them.*

Use an educational app for 10 minutes. Did you notice the difficulty changing based on your performance?

■ AI Chatbots & Writing Assistants (ChatGPT, Gemini, Copilot)

Large Language Models (LLMs) *like ChatGPT are based on* ***transformer neural networks*** *trained on hundreds of billions of words. GPT-4 has approximately* ***1.8 trillion parameters****. LLMs work by predicting the* ***next most likely token*** *in a sequence. They generate text statistically, not by truly "understanding" content. Key limitations: they can* ***hallucinate*** *(generate false information with confidence), can't verify their own claims, have a training cutoff date, and struggle with mathematical reasoning.* ***Using AI to write your homework is academic dishonesty****. However, using it to explain concepts or check reasoning can be a legitimate learning tool when used transparently.*

Ask an AI chatbot a factual question you know the answer to. Was it correct? Now ask about something very recent.

■ Translation Tools (Google Translate, DeepL, Apple Translate)

In 2016, ***Google Translate*** *switched from rule-based translation to* ***Neural Machine Translation (NMT)****, improving quality by up to* ***60%*** *overnight.* ***DeepL*** *is widely considered the most accurate translator, trained on* ***Linguee****, a database of over 1 billion professionally translated sentence pairs. Modern AI translation handles* ***100+ languages****,*

understands idioms, and can translate text from camera images in real-time (point your phone at a foreign sign and see it translated on screen, which combines OCR + NMT + AR). AI translation still struggles with humour, cultural references, and literary style.

Translate a sentence to another language and back. Is the meaning preserved? Try an idiom. What happens?

Category 3 Score: _____ / 50

Category 4: Out in the World

AI isn't just on screens; it's in shops, on roads, in hospitals, and even overhead. These items are harder to spot, so they're worth more points! **(15 points per item | max 75 points)**

■ Self-Service Checkouts & Smart Retail

*Self-checkout machines use **barcode scanning** combined with **weight verification AI** that detects if the scanned item's weight matches expectations. More advanced: **Amazon's "Just Walk Out"** technology uses **hundreds of ceiling cameras** and deep learning computer vision to track every customer and product. You walk out and get charged automatically. **Zara** and other retailers use AI to predict which styles will sell, optimise store layouts, and manage global inventory.*

Look for self-checkout machines, scan-and-go apps, or cashier-less technology. How does the machine verify what you've scanned?

■ Traffic Management & Smart Traffic Lights

*Many cities use **AI-powered adaptive traffic control**. Traditional lights use fixed timing; AI systems use cameras, inductive loop sensors, and radar to detect vehicles in real time and dynamically adjust green light duration. Pittsburgh's **Surtrac system** reduced travel times by **25%**, wait times by **40%**, and vehicle emissions by **21%**. The UK's **SCOOT** system manages traffic across entire city networks, coordinating thousands of lights simultaneously.*

At a traffic light, notice if timing seems to change based on traffic. Look for cameras on top, as those may be AI sensors.

■ Customer Service Chatbots (Websites, phone systems)

*When you contact a company's help centre, you'll likely interact with an AI chatbot first. These bots use **NLP** to classify your question and provide answers. About **67% of consumers worldwide** have interacted with an AI chatbot. More sophisticated systems use **RAG (Retrieval-Augmented Generation)**, which combines an LLM with company-specific docs to generate contextual responses. Companies deploy chatbots because they handle **unlimited simultaneous conversations 24/7** at a fraction of the cost.*

Visit a company's website chat. Is it a bot or human? Ask something unusual. How does it respond?

■ Security Cameras with AI (Facial recognition, behaviour detection)

*Modern CCTV uses AI for **facial recognition**, **anomaly detection** (flagging unusual behaviour), and **ANPR (Automatic Number Plate Recognition)** with **98%+ accuracy** at speeds over 100mph. China has over **600 million** CCTV cameras; the UK has approximately **7 million**. Airports use AI facial recognition for e-gates. Several cities (San Francisco, Portland) have banned government facial recognition due to privacy concerns.*

Look for CCTV cameras in public. How do you feel about AI watching you? Should there be limits?

■ Contactless Payments & Fraud Detection

*Every tap-to-pay triggers AI fraud detection in **under 50 milliseconds**. **Visa's AI** processes over **500 million transactions daily** and prevented an estimated **$25 billion** in annual fraud in 2023. **Mastercard's Decision Intelligence** uses a **recurrent neural network** to model each cardholder's unique spending behaviour. The AI analyses hundreds of data points per transaction: location, spending patterns, merchant type, amount, time, and device used.*

Have you or a family member ever had a payment declined or received a “was this you?” text? That’s AI fraud detection!

Category 4 Score: _____ / 75

Bonus Round: Hidden AI

These AI applications are the hardest to spot because they work entirely behind the scenes. To earn these points, you must explain *how* the AI works, not just that it exists. **(20 points per item | max 60 points)**

■ Social Media Feed Algorithm (Instagram, TikTok, X, Facebook)

*Your social media feed is **not** shown in chronological order. An AI algorithm selects and ranks posts to **maximise your engagement**. **TikTok's recommendation engine** can figure out your interests within **30 to 40 minutes of use**. It considers: watch time, replays, shares, comments, follows, searches, and even how long you pause on a post. **Instagram** uses separate algorithms for Feed, Stories, Reels, and Explore. These algorithms create **filter bubbles**, showing you more of what you already like, which can limit exposure to diverse viewpoints. In 2021, a Facebook whistleblower revealed internal research showing the algorithm prioritised "angry" reactions for more engagement.*

Compare your feed with a friend's. How different are they? Why? Is the algorithm showing you a balanced view?

■ Weather Forecasting AI

*In 2023, Google DeepMind released **GraphCast**, an AI model that produces a **10-day global weather forecast in under 60 seconds** on a single computer, and it's **more accurate** than the world's best traditional model (ECMWF's HRES) for **90% of weather variables**. GraphCast was trained on **40 years of historical weather data**. Other AI weather models include **Huawei's Pangu-Weather** and **NVIDIA's FourCastNet**. Traditional models take hours on supercomputers; AI does it in seconds.*

Check a weather app. How far ahead does it forecast? How accurate was yesterday's prediction?

■ Online Shopping & Dynamic Pricing

***Amazon's recommendation engine** drives an estimated **35% of total revenue**, over $150 billion annually influenced by AI suggestions. It uses **collaborative filtering**, **content-based filtering**, and **deep learning models** that analyse your click patterns, how long you view product pages, what you add to your basket but don't buy, and even what time of day you shop. **Dynamic pricing AI**: airlines, hotels, and ride-sharing services adjust prices in real-time based on demand, supply, competitor prices, weather, and local events. Amazon changes prices an estimated **2.5 million times per day**.*

Browse an online shop and note recommendations. Add something to your basket and see how suggestions change.

Bonus Round Score: _____ / 60

Your Final Score

Category	Items	Max	Your Score
1. In Your Home	5 × 10 pts	50	_____ / 50
2. Phone & Apps	6 × 10 pts	60	_____ / 60
3. School & Studying	5 × 10 pts	50	_____ / 50
4. Out in the World	5 × 15 pts	75	_____ / 75
5. Bonus Round	3 × 20 pts	60	_____ / 60
GRAND TOTAL		**295**	**_____ / 295**

Your AI Detective Rank

0 to 100 points: AI Beginner: You're just starting to notice AI around you. Keep looking!

101 to 175 points: AI Spotter: Good awareness! You know more than most adults.

176 to 235 points: AI Detective: Impressive! You can explain AI to others.

236 to 295 points: AI Expert: Outstanding! Consider a future in technology!

Reflection & Critical Thinking

Now that you've completed your scavenger hunt, take time to think deeply about what you've discovered. These questions develop critical thinking skills, an essential 21st-century skill.

1. The Surprise Factor

Which AI did you find most surprising? Why didn't you realise it was AI before? What does this tell you about how "invisible" AI has become?

2. AI Mistakes

Did any AI make a mistake during your hunt? What happened? What does this teach you about AI's limitations? Should we fully trust AI?

3. The Data Trade-Off

Choose one AI system you use regularly. What personal data does it collect to work? Are you comfortable with that trade-off?

4. Life Without AI

Imagine one AI from your hunt suddenly stopped working forever. How would your daily life change? What would you miss most? Anything you wouldn't miss?

5. The Bias Question

AI learns from human-created data, which can contain biases. Can you think of a situation where an AI might be unfair to certain groups? (Hint: think about facial recognition, hiring, or content recommendations.)

6. Your Position

Some think AI makes life better; others worry it’s too powerful. Based on your hunt, where do you stand? Give at least three specific examples.

Did You Know? Fascinating AI Facts

• **Google processes over 8.5 billion searches per day**, roughly 99,000 every second. Each uses multiple AI models.

• **Netflix's AI saves the company ~$1 billion per year** by recommending content so well that fewer subscribers cancel.

• **Your phone's voice assistant** uses speech models trained on over 600,000 hours of recorded speech, equivalent to 68 years of non-stop talking.

• **AI can beat humans** at chess (1997), Go (2016), poker (2017), StarCraft II (2019), and protein folding (2020). But it still can't fold laundry or understand sarcasm!

• **The world creates ~2.5 quintillion bytes of data daily**. That's 2,500,000,000,000,000,000 bytes. AI is the only way to process this.

• **AI autocorrect fixes ~50+ billion typos per day** across all smartphones worldwide.

• **Google DeepMind's AlphaFold** predicted the 3D structure of over 200 million proteins, a task that would have taken scientists billions of years traditionally.

• **Shazam** uses AI to match audio clips against 70 million songs in seconds, even in noisy environments.

• **Tesla's Autopilot** processes data from 8 cameras and 12 sensors simultaneously, making 144 trillion operations per second.

• **AI weather models** produce 10-day global forecasts in under 60 seconds, while traditional supercomputers take hours.

The Three Types of AI (Bonus Knowledge)

Type	What It Means	Examples	Status
Narrow AI (ANI)	Very good at **one specific task** but cannot do anything else. No general understanding or consciousness.	Siri, spam filters, chess engines, Face ID, recommendations, self-driving cars	**EXISTS TODAY** ALL current AI is Narrow AI
General AI (AGI)	Human-level intelligence that can **learn and perform any intellectual task** a human can.	A robot that could do homework, cook, write a novel, AND diagnose diseases, all at human level	**DOES NOT EXIST** Decades or centuries away
Super AI (ASI)	**Surpasses human intelligence** in every domain, including scientific creativity, social skills, and wisdom.	HAL 9000, Skynet, JARVIS (all purely fictional examples)	**THEORETICAL** No consensus if possible

Key takeaway: Every single AI you found on your scavenger hunt is **Narrow AI**. It's incredibly good at its specific job, but can't do anything outside that job. Siri can answer questions but can't play chess. AlphaGo can beat the world champion at Go but can't recognise a cat.

Congratulations on Completing Your AI Scavenger Hunt!

You now know more about AI than most adults! Understanding how AI works is the first step to using it wisely, safely, and responsibly. As AI continues to evolve, people who understand it, like you, will be better equipped to shape how it's used in society.

Remember: **AI is a powerful tool created by humans, for humans.** It's not magic, not sentient, and not perfect. Your critical thinking skills are your best defence against being manipulated by technology. Keep questioning, keep learning, stay curious!

"The real danger is not that computers will begin to think like humans, but that humans will begin to think like computers." ~ Sydney J. Harris