Introduction to AI: Lesson 1 Answer Key

# Worksheet

Video: <https://www.youtube.com/watch?v=EQfX2dlrlNo&feature=youtu.be>

*Stop the video at 3:30. Have students discuss questions 1-3 in groups of 3-4 for a few minutes, then discuss as a class.*

1. What is artificial intelligence?

**Artificial intelligence is the field of study that seeks to develop algorithms and software that enable machines to think and act like a human.**

1. What are some examples of AI that are already part of your daily life? What makes these examples AI?

**personal assistants (Siri, Alexa), mapping software, recommendation engines (Amazon, Spotify, Netflix)**

1. Discuss the differences between traditional software and AI. How does this combine thinking like a human and thinking rationally?

**AI does not tell a computer every step to take, but instead tells computers how to solve problems. It follows the steps of formulating the problem, identifying a goal, and developing a process to achieve that goal.**

1. Name an example of each of the following:

*Stop the video at 5:36. Give students enough time to explore the links below. Have students discuss in groups of 3-4 for a few minutes, then discuss as a class.*

* Problem Solvers

Hint: Check out these links

<https://course.elementsofai.com/2>

<https://www.tutorialandexample.com/problem-solving-in-artificial-intelligence/>

**online games (e.g. Chess), navigation systems**

* Language Processors

Hint: Check out this link

<https://becominghuman.ai/a-simple-introduction-to-natural-language-processing-ea66a1747b32>

**Google Translate, Spellcheck, personal assistants (Siri, Alexa)**

* Neural Networks

Hint: Check out these links

<https://www.the-scientist.com/magazine-issue/artificial-intelligence-versus-neural-networks-65802#:~:text=Machine%20Learning-,Neural%20Networks,is%20fed%20into%20the%20system.>

<http://neuralnetworksanddeeplearning.com/chap1.html>

**number identifying example from second link**

1. What does rationality mean with respect to AI? What is the goal of rationality?

**rationality – optimally achieving a pre-defined goal**

**goal – expressed with mathematical functions to either maximize utilities or minimize losses**

1. Define and name an example of each of the following:

* Knowledge Representation and Planning

**Definition: structures that represent knowledge; algorithms that compute actions over knowledge structure**

**Example: mapping software**

* Probabilistic Reasoning

**Definition: algorithms that deal with uncertain state, actions, and/or environments**

**Example: using a model for determining the likelihood and reason that a car will not start**

* Machine Learning

**Definition: algorithms that build inductive models from data; a model with input data, output data, and parameters used to determine output data based on input data**

**Example: classification (identifying pictures of cats or cancer cells)**

* Communication, Action, and Perceptions

**Definition: algorithms that enable intelligent, rational agents**

**Example: videogames (Pacman – the ghosts deciding whether or not they will chase Pacman)**

1. What are some of the ethical issues involved in AI?

Hint: Check out this article

<https://www.npr.org/2020/07/23/894351718/will-tiktok-be-banned-in-the-usa-it-may-depend-on-who-owns-it>

**Bias – taking in bad data and creating bad models**

**Privacy – when and where is it appropriate to deploy AI technologies?**

**Trustworthiness – ensuring that AI technology is safe**

**Security – ensuring AI technologies cannot be attacked by those who intend to do harm**

1. What is your biggest takeaway from this video? Something you found interesting or important.

# Assignment

Watch the Following Video: <https://www.youtube.com/watch?v=rJKmygzqM_E&feature=youtu.be>

Read the Following Article: <https://outsideinsight.com/insights/how-ai-helps-spotify-win-in-the-music-streaming-world/>

What’s a process you wish you could automate? For example, don’t you wish that instead of writing papers, you could feed an algorithm your notes from class and have it produce a cohesive paper for you? Do a quick Google search of your idea and see if any of this technology already exists. In about 500 words, briefly explain the process you’d like to automate, if any such technology already exists, and potential problems (technical or ethical) with implementing this technology.

*Give students time at the end of class to bounce ideas off one another. This can be a group or individual assignment.*