

TABLE 1

AI concepts covered.

Background	• What is Intelligence? • AI/ANN (Artificial Neural Networks) vs. Natural Intelligence • Brief History of Computers & Computing • Computational Thinking vs AI Thinking
Basics of AI	• Different Types & Examples of AI • Defining AI “Things” Like Machine Learning / Deep Learning • Classifying, Predicting & Generating Things • Examples of Modern AI in Everyday Life (AIoT) • Neural Networks: Recurrent vs Convolutional Neural Network (RNN vs CNN) • Brief Intro to Generative Adversarial Networks (GANs)
Neural Network Key Concepts	• Understanding Data / Dimensions & Related Math • Training AI Models • Data Bias / Weights • Some Basic Algorithms (Softmax vs Binary) • Visualizing AI Graphs (Loss/Accuracy)
Societal & Other Considerations	• Ethics of AI • Inherent Bias in AI • AI’s Impact On The Environment (Why We Need Lower Carbon Footprint “TinyML”) • The Potential Future Direction, and Outcomes of AI • Examples of How AI Can Change the World: Healthcare, Environment, Industry

TABLE 2

Creative outlets and approach.

Artistic Medium	Related Lessons
Art	The web-based Teachable Machine app is used to teach students about AI data-training. Students also manipulate Python OpenCV code to learn about image processing combined with face detection. Neural style transfer: Students use a Github Python program and pre-trained model, along with their own sample input art and photos to demonstrate how to transfer an art style to an image. Students discuss weights/biases of stroke, composition, and palette.
Video	Deepfakes, Neural Style Video: Students watch custom-made deepfakes and videos about full-video style transfer, and engage in demonstrations of the face-alignment processes used in video applications. Students use the free software EbSynth, combined with FFMPEG to make their own stylized videos. Students discuss the limitations of AI in terms of creating full video, and how some human intervention is still needed in this process, as well as the ethical implications of faux videos.
Music	Tensorflow / Magenta Web-based Experiments/Playground is used to demonstrate capabilities of the latest AI music software. Students then use Western classical music-trained models to try to generate new music snippets, based on basic RNN vs Lookback RNN and Attention RNN models, to determine which one is the best model and why this mathematical logic is best for music.
Poetry/ Narrative	Students use popular chatbots to discuss the logic behind modern natural language processing (NLP), the goal of passing the “Turing Test.” Then students use several curated github Python programs to learn about practical NLP and create poems in the style of the high Tang dynasty, which is multiple lines of 5 associated Chinese characters. Students try their best to train and develop a system capable of generating sensical poems.