Row	Model Level	Grillenberger	Concepts	Bloom	LO type	To be reviewed	Review reason	Group key	Index - code.org	L - Code.org	Index - Rising stars	LO - Rising stars	Index - Intel India	Intel India	Index - Raise MIT	Raise MIT	Index - Enaris	Enaris	Index - Apps for good	Apps for good	Index - Technovision	Technovision	Index - ML kids	ML kids
2	L3 - Application	C3 - data analysis		1 - Remember	unitary	☐	arbitrary definition of "areas of AI" provided in the	AI-intro									4	know different areas of AI						
3	L3 - Application	C3 - data analysis	AI	1 - Remember	unitary	☐		AI-intro							1	[Define artifical intelligence]	1	independently define intelligence for themselves						
4	L3 - Application	C3 - data analysis	AI	1 - Remember	unitary	☑	Very arbtirary categorisation of AI not used elsewhere.	AI-intro					2	Identify the 3 domains of AI (Data, Computer Vision, NLP).										
5	L3 - Application	C3 - data analysis	dataset, learning, algorithm, prediction	2 - Understand	composite	☐		AI-intro							2	[Recognise that AI has three parts - dataset, learning algorithm - prediction]					3	[Identify the three parts of an AI system]		
6	L3 - Application	C4 - ethics	AI definition	2 - Understand	composite	☐		AI-intro	23	Define artificial intelligence (AI) in their own words, using technologies they encounter in their daily lives as examples.			1	Describe application of AI in their daily lives			12	present personal viewpoints on AI systems in everyday life (using the example of "autonomous driving")			2	Recognize examples of AI around you		
7	L3 - Application	C3 - data analysis		2 - Understand	unitary	☐		AI-intro					11	Describe the stages in the AI project cycle										
8	L3 - Application	C3 - data analysis		2 - Understand	unitary	☐		AI-intro							17	[Identify AI systems that perform classification and generation]								
9	L3 - Application	C3 - data analysis		2 - Understand	unitary	☐		AI-intro							18	[Recognise the difference between classifying and generating]								
10	L3 - Application	C4 - ethics		2 - Understand	composite	☐		AI-intro					6	Be able to determine where AI solutions would be appropriate							9	Learn how AI can solve some problems better than others		
11	L3 - Application	C4 - ethics	jobs, machine learning	1 - Remember	unitary	☐		AI-society											42	Understand the range of jobs available developing machine learning				
12	L3 - Application	C4 - ethics	business model, machine learning	2 - Understand	composite	☐		AI-society											35	Understand different business models used for machine learning				
13	L4 - Ethics	C4 - ethics	AI applications, ethics	2 - Understand	composite	☐		AI-society	3	Describe how Artificial Intelligence is having an impact on society			5	Appreciate the complexity of social issues										
14	L4 - Ethics	C4 - ethics	ethics	2 - Understand	composite	☐		AI-society	24	Describe at least one example of an ethical issue pertaining to AI, along with its impact on society.	16	debate some ethical implications of AI	9	Describe some ethical concerns of AI with respect to inclusion, bias and privacy	21	[Identify consequences of using AI for a given scenario]								
15	L3 - Application	C4 - ethics	career, jobs, machine learning	2 - Understand	unitary	☐		AI-society											43	Understand the routes into a career in machine learning				
16	L4 - Ethics	C4 - ethics		2 - Understand	unitary	☐		AI-society							10	[Recognise the potential for bias in AI]							3	Describe ethical questions introduced by training bias in machine learning
17	L4 - Ethics	C4 - ethics	ethics, AI	2 - Understand	unitary	☑	unsure of relevance	AI-society									9	describe the trolley problem and the tension between two contradicting philosophical directions						
18	L4 - Ethics	C4 - ethics		2 - Understand	unitary	☐		AI-society					7	Describe how AI has been affecting jobs in various industries	30	[Recognise ways in which AI might impact job roles in the future]			16	Understand the potential impact of machine learning on employment and careers				Rec
19	L4 - Ethics	C4 - ethics		2 - Understand	unitary	☐		AI-society							14	[Describe factors that lead to algorithmic bias in machine learning]								
20	L4 - Ethics	C4 - ethics		2 - Understand	unitary	☐		AI-society							25	[Describe the potential negative consequences and misuse of deepfakes]								
21	L4 - Ethics	C4 - ethics		2 - Understand	unitary	☐		AI-society							26	[Identify key features that make up misinformation]								
22	L4 - Ethics	C4 - ethics		2 - Understand	unitary	☐		AI-society							28	[Recognise that AI models have a computational and environmental cost and how that in turn leads to								
23	L3 - Application	C4 - ethics	AI	3 - Apply	composite	☐		AI-society					3	Gain an awareness of where Artificial Intelligence is relevant in their own lives			2	reflect to what extent AI is built into everyday objects	20	Identify everyday problems which could be solved using machine learning				
24	L4 - Ethics	C4 - ethics		3 - Apply	unitary	☐		AI-society							11	[Apply the fairness rubric]								
25	L4 - Ethics	C4 - ethics		3 - Apply	unitary	☐		AI-society							29	[Apply ethical matrix to determine a goal and mitigate bias for a YouTube Recommender								
26	L4 - Ethics	C4 - ethics	ethics, AI	4 - Analyse	composite	☐		AI-society									11	classify central points of the EU ethical guidelines and question them critically						
27	L4 - Ethics	C4 - ethics		5 - Evaluate	composite	☐		AI-society					10	Be able to evaluate the cost and benefits of AI technology			5	understand possibilities and limitations of AI	19	Be able to evaluate the impact of machine learning across a range of different applications				

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28	L4 - Ethics	C4 - ethics	ethics	6 - Create	composite	☐		AI-society	22	Create at least one guiding principle that addresses an AI ethics issue.	17	articulate ethical principles for AI systems					6	argue about the relevance of ethical guidelines in AI systems	15	Be able to evaluate the impact of ethical considerations in the application of Machine	13	[Evaluate ethical considerations associated with a given problem AI		
29	L3 - Application	C3 - data analysis	facial recognition	2 - Understand	composite	☐		APP-FR											5	Understand how facial recognition works	16	Learn how computers can be trained to recognise faces		
30	L3 - Application	C3 - data analysis	facial recognition	2 - Understand	unitary	☐		APP-FR											7	Understand some of the issues surrounding facial recognition				
31	L3 - Application	C4 - ethics	facial recognition, bias	2 - Understand	unitary	☐		APP-FR											8	Understand how there can be bias in facial recognition				
32	L3 - Application	P3 - analyse and viz	facial recognition	3 - Apply	unitary	☐		APP-FR															15	Use a computer that has been trained to recognise what faces look like
33	L3 - Application	P3 - analyse and viz	facial recognition	3 - Apply	unitary	☐		APP-FR											6	Explore some of the uses of facial recognition				
34	L3 - Application	C3 - data analysis	supervised learning, image recognition	2 - Understand	composite	☐		APP-IMAGE					20	Describe the process involved in image classification					3	Understand how machines learn to identify images			5	Understand how computers can be trained to recognise pictures
35	L2 - Models	P2 - implementing	classifier, AI application, image recognition	3 - Apply	composite	☐		APP-IMAGE			11	train their own image recognition classifier											4	Teach a computer to recognise pictures
36	L3 - Application	P2 - implementing		3 - Apply	composite	☐		APP-IMAGE								c							21	Teach a computer to recognise shapes
37	L3 - Application	P3 - analyse and viz	image recognition	3 - Apply	composite	☐		APP-IMAGE			10	use an image recognition system												
38	L3 - Application	P3 - analyse and viz	image recognition, AI application	3 - Apply	composite	☐		APP-IMAGE			12	use image recognition in their own programs												
39	L3 - Application	C3 - data analysis		2 - Understand	composite	☐		APP-NLP															25	Learn how computers can be trained to find answers to questions in documents
40	L2 - Models	C3 - data analysis	chatbot, nlp	2 - Understand	unitary	☐		APP-NLP											9	Understand what a chatbot is				
41	L3 - Application	C4 - ethics		2 - Understand	unitary	☐		APP-NLP															26	Learn how "Question Answering" has been a field of machine learning research
42	L4 - Ethics	C3 - data analysis	nlp	2 - Understand	unitary	☐		APP-NLP											11	Recognise the advantages of natural language processing				
43	L2 - Models	P2 - implementing	classifier, text	3 - Apply	composite	☐		APP-NLP			14	train a text classifier												
44	L3 - Application	P3 - analyse and viz	AI application, classifier, text	3 - Apply	composite	☐		APP-NLP			15	use a text classifier in their own programs												
45	L3 - Application	P3 - analyse and viz		3 - Apply	unitary	☐		APP-NLP															24	Use a computer that has been trained to find the answers to questions
46	L4 - Ethics	P3 - analyse and viz	chatbot, nlp	5 - Evaluate	composite	☐		APP-NLP											12	Appreciate real life applications of chatbots				
47	L2 - Models	P2 - implementing	nlp, model	6 - Create	composite	☐		APP-NLP											10	Be able to build a natural language recognition model				
48	L3 - Application	P2 - implementing		3 - Apply	composite	☐		APP-REC															1	Teach a computer to make recommendations
49	L1 - Engines	P2 - implementing	speech recognition	2 - Understand	composite	☐		APP-SOUND			4	explain how machine learning distinguishes between phonemes												
50	L3 - Application	C3 - data analysis		2 - Understand	unitary	☐		APP-SOUND															14	Learn how computers can be trained to listen for specific key words
51	L3 - Application	C3 - data analysis		2 - Understand	unitary	☐		APP-SOUND															20	Learn how computers can be trained to recognise words
52	L3 - Application	P3 - analyse and viz	AI application, speech recognition	3 - Apply	composite	☐		APP-SOUND			6	use speech recognition in their own programs											13	Teach a computer to listen for words
53	L3 - Application	P3 - analyse and viz	AI application, speech recognition	3 - Apply	composite	☐		APP-SOUND			5	use a speech recognition system												

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54	L3 - Application	P2 - implementing		3 - Apply	composite	☐		APP-SOUND															19	Teach a computer to recognise sound
55	L2 - Models	P3 - analyse and viz		2 - Understand	unitary	☑	Data & Information	DATA					16	Recognize different types of graphs used in data visualization										
56	L2 - Models	P3 - analyse and viz	visualisation (graph)	3 - Apply	composite	☑	Data & Information	DATA	19	Use data visualizations to find patterns in numerical data														
57	L3 - Application	P1 - gathering		3 - Apply	composite	☑	Data & Information	DATA					15	Draw System Maps										
58	L3 - Application	P1 - gathering		3 - Apply	composite	☑	Data & Information	DATA					14	Identify data required regarding a given problem										
59	L2 - Models	P1 - gathering	data processing, data gathering	4 - Analyse	composite	☑	Data & Information	DATA											25	Be able to prepare data for a machine learning model				
60	L2 - Models	C1 - information	node, flow chart, decision tree	2 - Understand	composite	☐	Validate group-key	ENG-DT							7	[Indentify flow charts as consisting of nodes and branches]								
61	L2 - Models	C3 - data analysis	decision, random	2 - Understand	composite	☐		ENG-DT	4	Describe how a model makes a decision (for example: with randomness, or a decision tree, or using data)			19	Explain how decision trees work	6	[Explain the purpose of a decision tree]							12	[Describe a decision tree classifier]
62	L1 - Engines	P2 - implementing	classifier, decision tree, supervised learning, feature	3 - Apply	composite	☐		ENG-DT			1	create a decision tree classifier			9	[Draw a decision tree to classify items]								
63	L2 - Models	P2 - implementing	training, decision tree, classifier	3 - Apply	composite	☐		ENG-DT			3	train a machine learning decision tree classifier												
64	L3 - Application	C3 - data analysis		1 - Remember	unitary	☐		ENG-NN							19	[Remember that Generative Adversarial Networks, or GANs, that are a kind of AI that can								
65	L1 - Engines	C3 - data analysis	neuron, neural network	2 - Understand	composite	☐		ENG-NN			8	explain the role of input nodes												
66	L1 - Engines	C3 - data analysis	neuron, neural network, learning	2 - Understand	composite	☐		ENG-NN					21	Describe how a neural network works	15	[Identify a neural network as a supervised learning algorithm]			4	Understand what neural networks are				
67	L1 - Engines	C3 - data analysis	neuron, neural network	2 - Understand	unitary	☐		ENG-NN			7	take part in a simulation of a neural network												
68	L1 - Engines	C3 - data analysis		2 - Understand	unitary	☐		ENG-NN							16	[Recognise that training a neural network is a multistep process of tuning weights and								
69	L1 - Engines	C3 - data analysis		2 - Understand	unitary	☐		ENG-NN							20	Understand how the generator and discriminator compete with one another to train a								
70	L3 - Application	C4 - ethics		2 - Understand	unitary	☐		AI-society							23	[Describe the term deepfake]								
71	L3 - Application	C4 - ethics		2 - Understand	unitary	☐		AI-society							24	[Identify common indicators of a deepfake image or video]								
72	L1 - Engines	P2 - implementing	neural networks, algorithm, feedback	4 - Analyse	composite	☐		ENG-NN			9	understand how neural networks use feedback to learn												
73	L4 - Ethics	C4 - ethics		5 - Evaluate	composite	☐		ENG-NN							22	[Question ownership of GAN generated output]								
74	L2 - Models	C3 - data analysis	regression, classification, clustering	1 - Remember	composite	☐		MOD-base					18	List common regression, classification and clustering models					37	Understand basic machine learning algorithms				
75	L2 - Models	C3 - data analysis	supervised learning, training set, data	1 - Remember	unitary	☐		MOD-base									14	name the value and requirements of training data						
76	L2 - Models	C3 - data analysis		2 - Understand	composite	☑	poorly formulated, re-formulated as clustering-related LO	MOD-base															8	Understand that predictive analytics can be used to identify patterns in
77	L3 - Application	C3 - data analysis	machine learning	2 - Understand	composite	☐		MOD-base											2	Understand how machines learn				
78	L2 - Models	C1 - information	features, data	2 - Understand	unitary	☐		MOD-base							8	[Identify characteristics as features]								
79	L2 - Models	C3 - data analysis	supervised, unsupervised, learning	2 - Understand	unitary	☐		MOD-base	2	Describe the differences between supervised and unsupervised learning.									36	Understand the difference between supervised and unsupervised learning				

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80	L2 - Models	C3 - data analysis	classification, prediction	2 - Understand	unitary	☐		MOD-base							12	[Identify that classification algorithms make predictions]								
81	L2 - Models	C3 - data analysis	training, testing	2 - Understand	unitary	☐		MOD-base			2	understand the difference between training and test data												
82	L2 - Models	C3 - data analysis	supervised learning	2 - Understand	unitary	☐		MOD-base									13	explain Supervised Learning as a mapping function						
83	L2 - Models	C3 - data analysis	supervised learning	2 - Understand	unitary	☐		MOD-base									15	estimate if an application is using supervised learning						
84	L2 - Models	C3 - data analysis	supervised learning	2 - Understand	unitary	☐		MOD-base									16	name problems and limitations of supervised learning						
85	L3 - Application	C3 - data analysis	machine learning	2 - Understand	unitary	☐		MOD-base											1	Understand what machine learning is				
86	L2 - Models	P3 - analyse and viz	feature, visualisation (graph), data exploration, feature selection	3 - Apply	composite	☐		MOD-base	8	Use data visualization tools to decide which features to include when training a model			17	Exploring various patterns and trends out of the data explored					40	Be able to use machine learning tools to visualise data.				
87	L2 - Models	P2 - implementing	algorithm, model, machine learning	3 - Apply	composite	☐		MOD-base											38	Be able to use basic machine learning algorithms				
88	L2 - Models	P2 - implementing		3 - Apply	composite	☐		MOD-base															7	Teach a computer to predict numerical outcomes based on historical data
89	L2 - Models	P3 - analyse and viz	model, feature, feature selection, training	3 - Apply	composite	☑	same as row 86	MOD-base	7	Use AI Lab to select features to train a model														
90	L2 - Models	P1 - gathering	types of variables	4 - Analyse	unitary	☐		MOD-base	18	Compare and contrast categorical data versus numerical data														
91	L2 - Models	P1 - gathering	label, examples, model	6 - Create	composite	☐		MOD-base			13	add examples or labels to an existing model												
92	L2 - Models	P2 - implementing	model, training, test	6 - Create	composite	☐		MOD-base											31	Be able to develop and train your machine learning model	4	Train your first AI model to learn from data	6	Apply machine learning in a mobile app.
93	L2 - Models	C3 - data analysis	model complexity, bias, variance, model quality (good vs bad model)	2 - Understand	composite	☐		MOD-eval	10	**Read a model card** and use it to evaluate a model [Know some of the key features of a machine model e.g bias, xxx.]													2	Understand the impact of training bias on machine learning systems
94	L2 - Models	C3 - data analysis	bias, variance, generalisability, model evaluation	2 - Understand	composite	☐		MOD-eval											14	Understand potential issues with the application of machine learning				
95	L2 - Models	C3 - data analysis		2 - Understand	composite	☐		MOD-eval															23	Understand the importance of variety in training machine learning systems.
96	L2 - Models	C3 - data analysis		2 - Understand	unitary	☐		MOD-eval															17	[Recognise that the accuracy of a machine learning model can be
97	L2 - Models	C3 - data analysis		2 - Understand	unitary	☐		MOD-eval	16	Explain how accuracy calculation for numerical data is different from categorical data														
98	L2 - Models	P2 - implementing	dataset, model	3 - Apply	composite	☐		MOD-eval	25	Create a machine learning model using a real-world dataset									41	Be able to use python to import data and run basic machine learning algorithms				
99	L2 - Models	P3 - analyse and viz	visualisation, feature selection	3 - Apply	composite	☐		MOD-eval	13	Use data visualizations and feature iteration to train machine learning models														
100	L1 - Engines	P4 - sharing	model, model components	4 - Analyse	composite	☐		MOD-eval											34	Be able to summarise the key points of your machine learning model in a short presentation				
101	L3 - Application	P1 - gathering		4 - Analyse	composite	☑		MOD-eval											21	Gain a better understanding of the data requirements of your machine learning idea				
102	L2 - Models	P4 - sharing	stakeholder	4 - Analyse	composite	☑		MOD-eval											24	Gain a better understanding of who would use your machine learning model and who would benefit				
103	L1 - Engines	P3 - analyse and viz	model evaluation, model comparison, accuracy	5 - Evaluate	composite	☐		MOD-eval											32	Be able to improve the accuracy of your model			18	[Improve a model by adding more training data]
104	L2 - Models	C3 - data analysis	model complexity, bias, variance, model quality (good vs bad model)	5 - Evaluate	composite	☐		MOD-eval	11	Read a model card and **use it to evaluate a model** [Evaluate a machine learning model in terms of bias, xxx														

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105	L3 - Application	C3 - data analysis		5 - Evaluate	composite	☐		MOD-eval											23	Be able to critically evaluate machine learning ideas and select the strongest to take forward				
106	L2 - Models	P3 - analyse and viz	supervised learning	6 - Create	composite	☐		MOD-eval									17	train their own supervised learning model and use it inside an application						
107	L2 - Models	P3 - analyse and viz	project lifecycle, user requirements	6 - Create	composite	☐		MOD-eval											26	Be able to design a machine learning model that will meet the needs of the user				
108	L2 - Models	P3 - analyse and viz	decision, data similarity	2 - Understand	composite	☐	Need context. Unclear what is understood by "decision"	MOD-eval	17	Explain how computers can make decisions by comparing similarities in data														
109	L2 - Models	P3 - analyse and viz	pattern, decision	2 - Understand	composite	☐	Need context. Unclear what is understood by "decision"	MOD-eval	6	Explain how computers can separate data to make a decision									13	Understand how Machine Learning is used to make decisions				
110	L2 - Models	C3 - data analysis	pattern, decision	2 - Understand	composite	☐	Need context. Unclear what is understood by "pattern" and	MOD-eval	5	Look for patterns in data to help make a decision														
111	L1 - Engines			2 - Understand	unitary	☑	Not specific to AI/ML	NA							3	[Describe the purpose of an algorithm]	3	understand the concept of algorithms and data						
112	L4 - Ethics			2 - Understand		☑	Not specific to AI/ML	NA							5	[Describe the stake holders for an algorithm]								
113				3 - Apply	composite	☑	Not specific to AI/ML	NA	1	Apply the Problem Solving Process to train a computer to solve a problem														
114	L3 - Application			3 - Apply		☑	Not specific to AI/ML	NA					12	Apply the problem scoping framework										
115	L3 - Application			3 - Apply		☑	Not specific to AI/ML	NA					13	Frame a Goal for the project										
116	L4 - Ethics	C4 - ethics	ethics, AI	5 - Evaluate		☑	Not specific to AI/ML	NA									10	form their own philosophical point of view and classify it correctly						
117	L1 - Engines			6 - Create	composite	☑	Not specific to AI/ML	NA							4	[Write a simple algorithm to solve a problem]								
118	L2 - Models	P1 - gathering	feature, feature selection	3 - Apply	composite	☑	Tool specific LO?	NA	21	Use the Model Card to create new input elements for a machine learning app														
119				3 - Apply		☑	Tool specific LO?	NA	9	Create an app that uses machine learning [Modify an existing simple app that uses ML]														
120				3 - Apply		☑	Tool specific LO?	NA	12	Create model cards in AI Lab to save machine learning models														
121				3 - Apply		☑	Tool specific LO?	NA	14	Use a model card to update the user interface of an app														
122				3 - Apply		☑	Tool specific LO?	NA	15	Use if-statements to change the behavior of an app														
123				6 - Create		☑	Tool specific LO?	NA	26	Create an app that uses a machine learning model														
124				4 - Analyse		☑	Tool specific LO?	NA	20	Update the default model code to use new inputs in a machine learning app														

AI & ML Objectives	Group Key	Description
0 - Stats	DATA	Data related competencies (unclear whether they belong to the AI/ML strand or the Data & Information strand)
1 - Engines	ENG-DT	Engine - Decision Trees
1 - Engines	ENG-NN	Engine - Neural Networks
2 - Models	MOD-variables	Models - Introductory concepts related to intuition around models - what models are and what they are used for - and variables
2 - Models	MOD-tasks	Models - Concepts around learning and task types, such as what is learning and different types of learning (supervised vs unsupervised)
2 - Models	MOD-build	Models - Concepts around building models (engines?)
2 - Models	MOD-testing	Models - Concepts around testing, comparing and evaluating models
3 - Application	APP-FR	Application - Facial Recognition
3 - Application	APP-IMAGE	Image recognition and classification, object detection, etc.
3 - Application	APP-NLP	Application - Natural Language Processing (text recognition and language comprehension)
3 - Application	APP-REC	Application - Recommendation (e.g. films to watch, books to read, places to visit/go on holiday to)
3 - Application	APP-SOUND	Application - Speech and sound recognition
3 - Application	AI-intro	General concepts of AI, not specific to a particular application.
4 - Social	AI-society	Competencies around the application of AI/ML in society

	Name	Number of lessons	Link	Progression maps	Age span	Comment			Ancillary support information/ papers					
1	Code.org	15	AI and ML module		Not stated	Set of lessons called a module								
2	Indian curriculum CBSE - Intel India (AI curriculum handbook)	4 units (112 hours) 10 lesson plans of one AI curricula. 2 main units with 5 lesson plans each, targeted for 13+ ages with clear objectives,	http://cbseacademic.nic.in/web_material/Curriculum20/AI_Curriculum_Handbook.pdf		Class 8,9,10 (14-16 I think)	Indian curriculum for class 8-11(13+ ages-secondary school) the course is optional. Central Board of Secondary Education (CBSE) has decided to introduce artificial. students will engage in Experiences of creating by Identifying Problem solving, decision making, ethics and future career opportunities. the modules cover Introduction to AI (purpose and ethics), AI project cycle (problem solving,data aquisition, exploration and modelling), neural network, introduction to python and co-curricular skills.			4	Andreas Grillenberger's Data Competency Model		Research paper	K-12	Not a set of lessons but gives a very solid starting point for concepts (content) and skills (process)
3	MIT AI RAISE	20+ lesson plans. some contain mini curriculums (not sure if they are). some detailed lesson objectives (curriculum ones), most not. collected from various sources. include for RPF	https://raise.mit.edu/daily/index.html		8-13	MIT Daily Middle school curriculum								
4	AppsForGood	14 session plans for a course. Lesson objectives included. Include for RPF	https://www.appsforgood.org/courses/machine-learning			Students explore a wide range of machine learning applications and assess the social, legal and ethical impact of the use of AI algorithms Student work in teams or individually to design and build a prototype that solves a problem they care about using machine learning altorithms Students work their way through a range of activities, split across 10-15 sessions See below for the scheme of work, student workbook, and learning objectives								
5	AI4K12	9 lesson plans of AI curriculum. lesson objectives included. include for RPF	https://ai-4-all.org/open-learning/resources/	https://ai4k12.org/big-idea-1-overview/ https://ai4k12.org/big-idea-2-overview/ https://ai4k12.org/big-idea-3-overview/		AI4ALL is an Oakland, Calif.-based nonprofit that opens doors to the artificial intelligence industry for historically excluded talent through education and mentorship. They nurture a global community of students who learn AI fundamentals and who then apply those principles to solve society's most pressing problems in deeply innovative and ethical ways. The open-learning is their resently new online resource for high school teachers of all subjects to bring AI education to their classrooms through a free, adaptable AI curriculum and teacher resources.								
6	Technovation	10 lesson plans. not curricula, has lesson objectives, include for RPF	https://www.curiositymachine.org/lessons/lesson/			Technovation provides hands-on artificial intelligence (AI) education challenge brings families, schools, communities, and technology professionals together to learn, play and create solutions to real-world problems with AI. It includes 10-lesson challenges. Students work together in a project to complete a challenge of AI invention that solves a problem they care about in their community.								
7	IBM Machine Learning for kids	42 worksheets using pre-trained models of which 9 are train a computer to recognise text, 14 are train a computer to recognise images, 12 are	https://machinelearningforkids.co.uk/#!/worksheets			WE need to do a selection. Or get Dale to summarise! Online tutorials guiding children to create a game or interactive project that demonstrates a real-world use of artificial intelligence and machine learning.	https://github.com/IBM/taxinomitis-docs/blob/master/project-worksheets/pdf/worksheet-touristinfo.pdf	https://github.com/IBM/taxinomitis-docs/blob/master/project-worksheets/pdf/worksheet-findit.pdf	https://github.com/IBM/taxinomitis-docs/blob/master/project-worksheets/pdf/worksheet-titanic-python.pdf	https://github.com/IBM/taxinomitis-docs/blob/master/project-worksheets/pdf/worksheet-shootthebug.pdf	https://github.com/IBM/taxinomitis-docs/blob/master/project-worksheets/pdf/worksheet-jargonbuster.pdf	https://github.com/IBM/taxinomitis-docs/blob/master/project-worksheets/pdf/worksheet-lasereyes.pdf	https://github.com/IBM/taxinomitis-docs/blob/master/project-worksheets/pdf/worksheet-rockpaperscissors.pdf	https://github.com/IBM/taxinomitis-docs/blob/master/project-worksheets/pdf/worksheet-quizshow.pdf
8	Beverly Clark	6 lessons plans in separate pdfs files. not really detailed lesson plans	http://aiinschools.com/			We should include as its Beverly and she went early and has a UK background. A program that aims to demystify the topic of AI.								

	Name	Number of lessons	Link	Progression maps	Age span	Comment			Ancillary support information/ papers					
9	ELDRIS/ENARIS (Irobot)	3 lesson plans in one AI module targeted for 10-14 yrs, has learning objectives, exclude for RPF	https://enaris.org/material/en/index.html			Although this is less than the 6 lessons minimum - we should include as this is very research informed. AI-course covering major AI topics (problem-solving, search, planning, graphs, data structures, automata, agent systems, machine learning). "Enaris from Martin Kandlhofer from Gratz Austria-----The goal of the ENARIS-project is to help educate children about the possibilities, limitations and inner workings of AI-systems. Made for class room usage Adaptable to the needs of the class Tailored to educators Independently usable and each module ranges from 1 to 4 hours Available in digital (online and offline) and printable form. consists of 3 modules"								
10	Rising Stars	6 sessions, targeted for Key Stage 3 learners? (since it describes what pupils have encountered in key stages 1 and 2)			Key Stage 3?	Activity based teaching with extensive use of software and hardware resources. **Software**: Scratch (Machine Learning for Kids version), Audacity, Google Chrome; **Hardware**: Laptop/desktop/Chromebook computers, iPads, smart speaker (Google Home/Amazon Echo) optional								
11	Teach London Computing	3 activities	https://teachinglondoncomputing.org/machine-learning/											