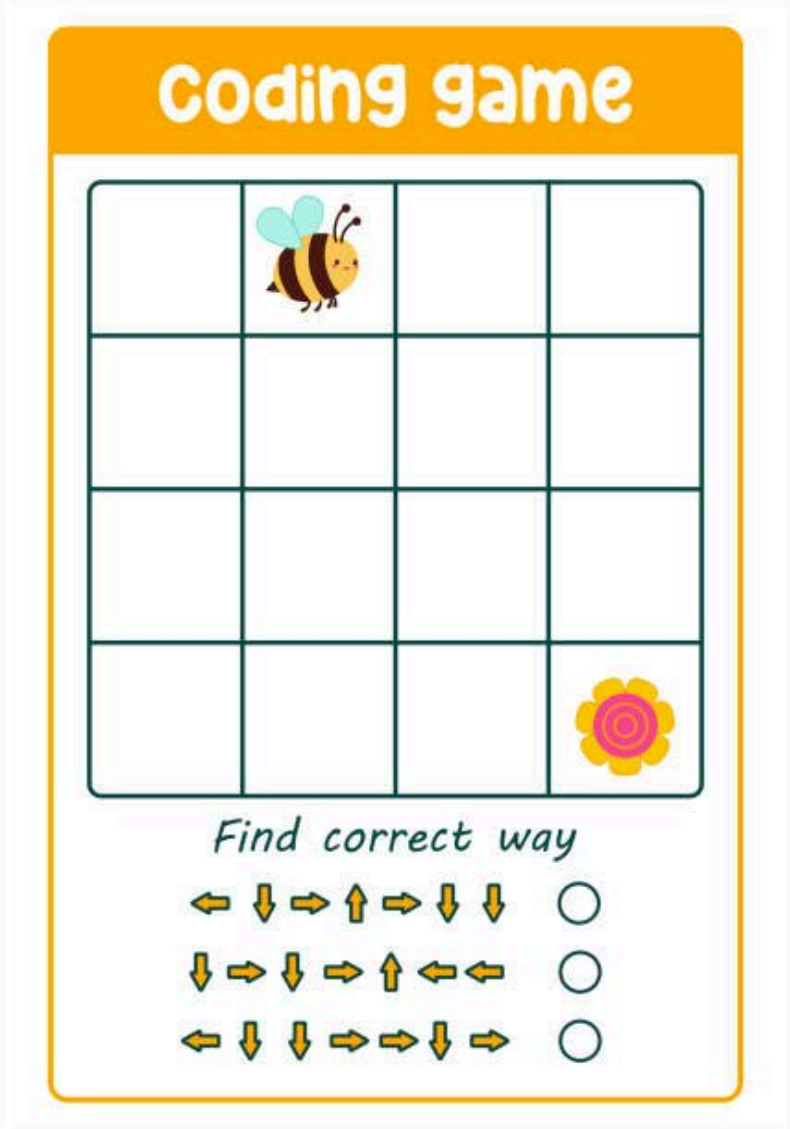
Tech Club

Class 5: Building Blocks of Programming

VOCABULARY:

- **AI:** An abbreviation for artificial intelligence. AI is the ability of computers to learn and perform tasks like humans including reading, writing, speaking, seeing, and understanding.
- **Coding:** The process or activity of writing computer programs.
- **Program:** A planned series of things to do or instructions to follow.



THE A.I. GAME

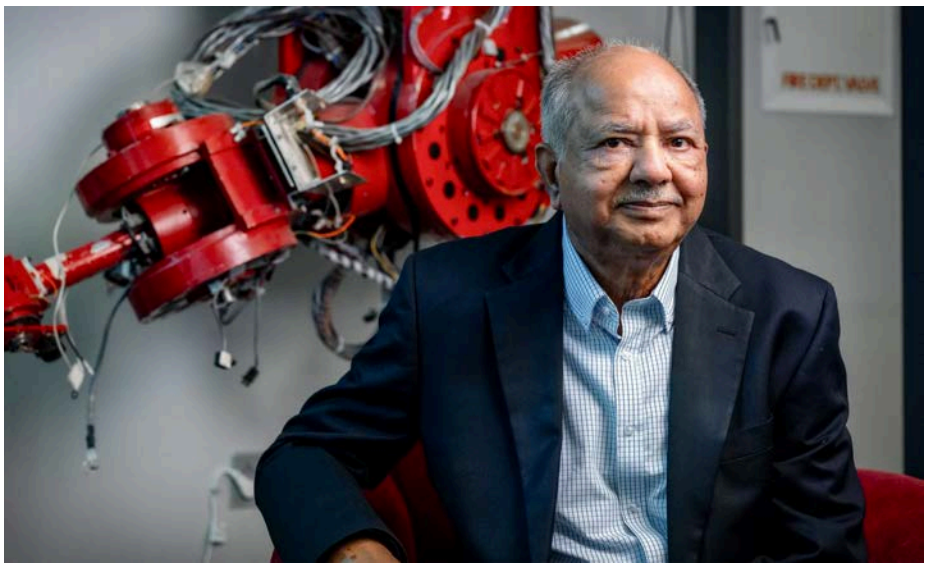
BACKGROUND:

AI is a big buzzword, with the technology growing and becoming more integrated in our electronic usage every day. True AI does not currently exist, but programs like ChatGPT mimic the ability to think like a human. The types of programs we call AI are: virtual assistants like Siri and Alexa, chatbots like Messenger, writing software like Grammarly, and large language models like Gemini and Claude. Plenty of other programs also use AI technology to improve services - Google Maps, Spotify, TikTok, and Apple Watch.

One thing about AI that might surprise you is that it only has access to information that is already available. If an AI model is looking for the answer to a question, it searches the existing data found on the internet. This means the answer it gives is only as good at the information it finds. Today you will play a game demonstrating a simplified version of how AI gathers information and is able to incorporate new information into its answers.

ENGINEER SPOTLIGHT:
Dr. Raj Reddy, Computer Scientist

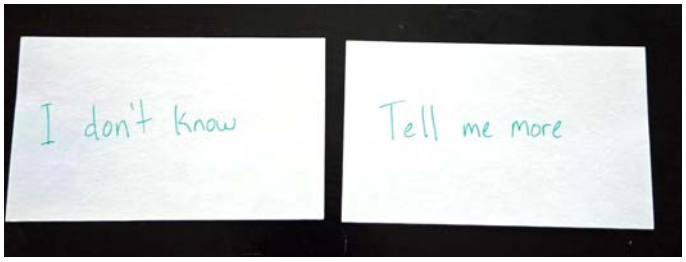
Dr. Raj Reddy was the first person to earn a computer science Ph.D. at Stanford University and one of the first computer scientists in the world to work on Artificial Intelligence. Originally from Katur, India, Dr. Reddy started the Rajiv Gandhi University of Knowledge Technologies and is constantly pushing for using technology to help people and society. Let's investigate how AI works, just like Dr. Reddy.



STEPS:

1. With your partner, discuss how AI learns new information.
2. You and your partner will receive **one set of AI index cards and a pencil**.
3. You will be learning how AI uses and collects information. Decide which person will be the AI and which person will be the User.
4. Make a hypothesis about whether the AI can answer any questions the User asks.

5. The bundle of index cards has 5 cards with pre-written words or phrases. These cards are the base knowledge of the AI. The rest of the cards are blank and will be used to gather new information.
6. Game Rules:
    - The User starts by asking the AI a question. This can be any question they like, for example, "Why do people think roller coasters are fun?"
    - The AI can only answer by laying down one or more cards.



    - Using the question asked by the User, the AI chooses one word or phrase from the question to write on a blank card. In the example the AI chose to use the word "fun" from the original question. This card can now be used to answer questions from the User.

- Have the User ask another question (or the same question again). The process repeats with the AI answering the question only using the cards, then adding a new word or phrase from the new question to another blank card.

7. After playing about 5 rounds, switch roles.
8. Once both players have had a turn as the AI, discuss whether your hypotheses were supported. Write your thoughts here:

9. What have you learned about AI?

10. What happens when AI is fed misinformation?

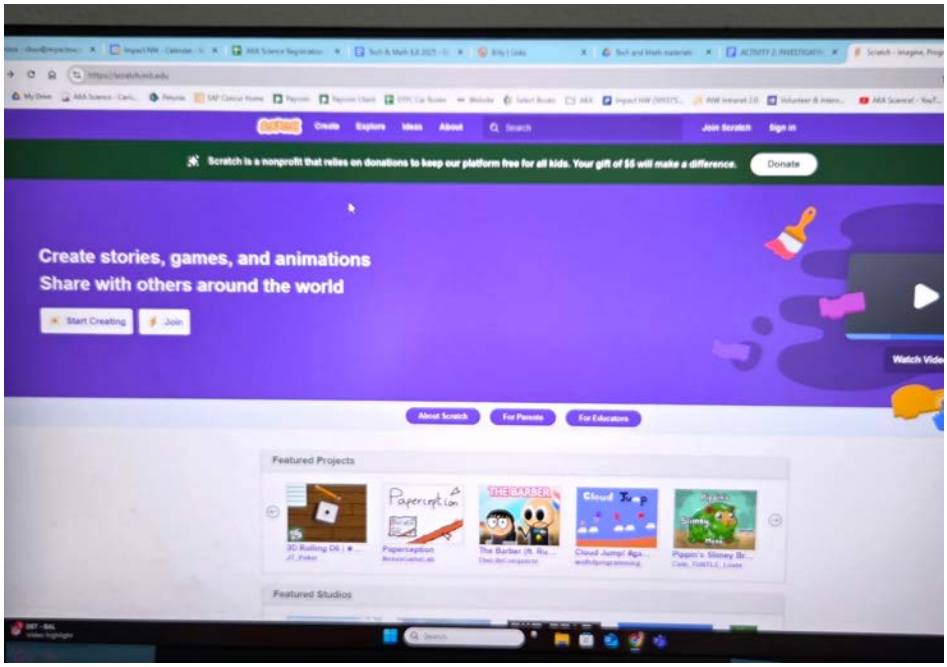
INTRO TO SCRATCH

BACKGROUND:

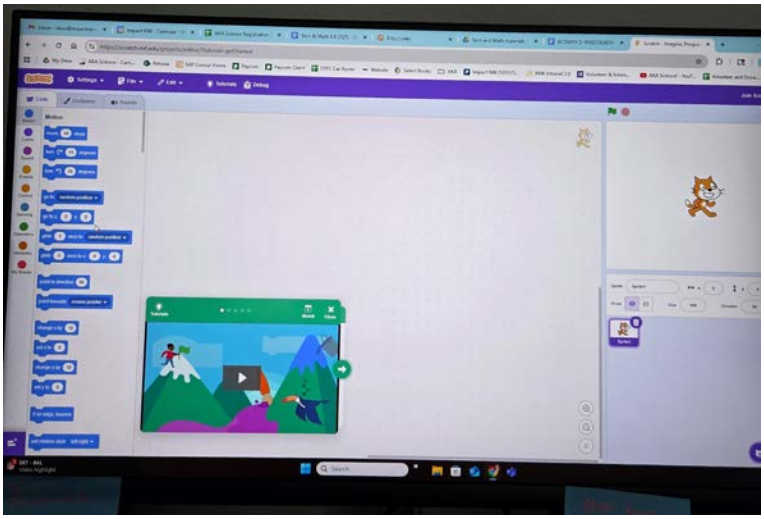
How does a computer program work? It may seem complex, but computers just follow a set of directions. In previous activities we looked for patterns and sorted data (objects) into sets. This is the basis of programming - using a pattern, or programming language, to send a set of instructions, or algorithm, which tells the computer what to do. Writing a set of instructions may seem simple enough, but it's deceptively difficult. Everything we want a computer to do must be spelled out exactly, even something as simple as moving a cursor or blinking a light. The next activity will challenge your students to try Scratch, a programming language created by MIT.

STEPS:

1. Today you will learn some simple programming using the Scratch website. Scratch was created by MIT to teach programming, also called coding, by using a drag and drop method.
2. Open your chromebooks and go to scratch.mit.edu.



3. Click the “Start Creating” button on the left side of the screen. This will take you to the project editor.



4. From here, you can choose to watch and follow the tutorials at the bottom of the screen, play around on their own by dragging and dropping commands, or click on the “Tutorials” menu on the top of the screen and select a project from there.
5. You can use this space to plan your own project if you have experience with Scratch.

PLAN YOUR PROJECTS

BACKGROUND:

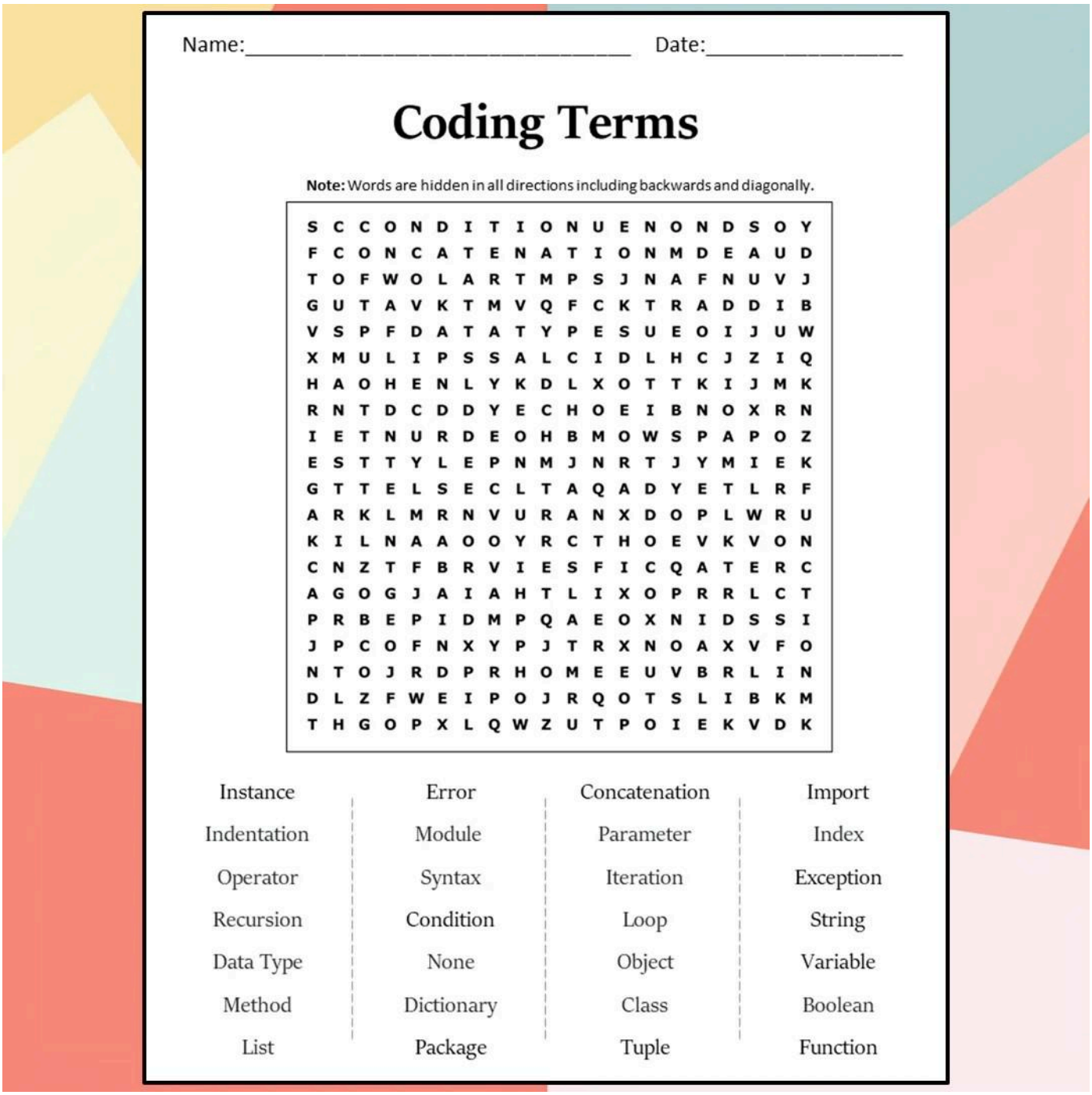
You have learned so much about sorting data, programming, and building circuits over the last few weeks. You are now going to use all of these skills to make your own inventions for the remaining classes. The purpose of this activity is to form groups and begin planning what you would like to create. You will be allowed to use any remaining materials, except the butcher paper in the Class 8 bag, to get as creative as possible and use up any leftover supplies.

STEPS:

1. Form a group and discuss what piece of technology you would like to build. If you need an idea, discuss with your Class Leader.
2. Use the space here to plan. Remember the following rules:
    - Computers can be used for research or programming, but not for playing existing games or social media.
    - Everyone in the group should be participating in some way.

3. Make sure to have a hypothesis to test that is appropriate for your project:

FOR FUN! Solve the wordsearch



Name:_____ Date:_____

Coding Terms

Note: Words are hidden in all directions including backwards and diagonally.

S	C	C	O	N	D	I	T	I	O	N	U	E	N	O	N	D	S	O	Y
F	C	O	N	C	A	T	E	N	A	T	I	O	N	M	D	E	A	U	D
T	O	F	W	O	L	A	R	T	M	P	S	J	N	A	F	N	U	V	J
G	U	T	A	V	K	T	M	V	Q	F	C	K	T	R	A	D	D	I	B
V	S	P	F	D	A	T	A	T	Y	P	E	S	U	E	O	I	J	U	W
X	M	U	L	I	P	S	S	A	L	C	I	D	L	H	C	J	Z	I	Q
H	A	O	H	E	N	L	Y	K	D	L	X	O	T	T	K	I	J	M	K
R	N	T	D	C	D	D	Y	E	C	H	O	E	I	B	N	O	X	R	N
I	E	T	N	U	R	D	E	O	H	B	M	O	W	S	P	A	P	O	Z
E	S	T	T	Y	L	E	P	N	M	J	N	R	T	J	Y	M	I	E	K
G	T	T	E	L	S	E	C	L	T	A	Q	A	D	Y	E	T	L	R	F
A	R	K	L	M	R	N	V	U	R	A	N	X	D	O	P	L	W	R	U
K	I	L	N	A	A	O	O	Y	R	C	T	H	O	E	V	K	V	O	N
C	N	Z	T	F	B	R	V	I	E	S	F	I	C	Q	A	T	E	R	C
A	G	O	G	J	A	I	A	H	T	L	I	X	O	P	R	R	L	C	T
P	R	B	E	P	I	D	M	P	Q	A	E	O	X	N	I	D	S	S	I
J	P	C	O	F	N	X	Y	P	J	T	R	X	N	O	A	X	V	F	O
N	T	O	J	R	D	P	R	H	O	M	E	E	U	V	B	R	L	I	N
D	L	Z	F	W	E	I	P	O	J	R	Q	O	T	S	L	I	B	K	M
T	H	G	O	P	X	L	Q	W	Z	U	T	P	O	I	E	K	V	D	K

Instance	Error	Concatenation	Import
Indentation	Module	Parameter	Index
Operator	Syntax	Iteration	Exception
Recursion	Condition	Loop	String
Data Type	None	Object	Variable
Method	Dictionary	Class	Boolean
List	Package	Tuple	Function