Student Sheet: "Jitterbugs"

Name: ________________________________ Date: _______________ Session #: ___

Part I: "Giving an Inch, Going a Mile"

Read the short story below called "A Heart-Worming Friendship", about two inchworm friends, Ivy and Oscar.

Once upon a leafy morning in The Vibrant Garden, there lived two inchworms named Ivy and Oscar. Ivy was adventurous and loved exploring every nook and cranny, while Oscar was timid and preferred to stay within the safety of the leaves. Despite their differences, they shared a bond of friendship that seemed unbreakable.

One day, a sudden storm swept through the garden, scattering leaves and shaking the branches. Amidst the chaos, Ivy and Oscar got separated. Ivy, determined to find her friend, wriggled through the stormy winds and raindrops, calling out for Oscar.

Finally, after what felt like an eternity, Ivy found Oscar huddled under a leaf, shivering with fear. She gently nudged him, and Oscar's eyes filled with relief as he saw his friend.

"Ivy, I was so scared," Oscar whispered, his voice trembling. "I thought I was all alone."

Ivy smiled warmly. "You're never alone, Oscar. We're friends, and friends stick together through thick and thin."

From that day forward, Ivy and Oscar became inseparable. Ivy encouraged Oscar to step outside his comfort zone, while Oscar taught Ivy the value of patience and compassion. Together, they faced challenges, explored the vast garden, and discovered the beauty of friendship.

Their bond grew stronger as they supported each other's dreams. Ivy, with her agile moves, helped Oscar gain confidence in his own abilities. Oscar, with his thoughtful nature, provided Ivy with wise advice during their adventures.

Their friendship didn't just brighten their own lives but also inspired others in the garden. Bees buzzed cheerfully, butterflies danced with joy, and even the birds chirped a little louder, all witnessing the incredible power of friendship.

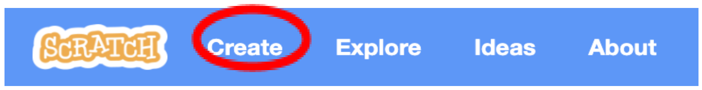
As time passed, Ivy and Oscar transformed into graceful butterflies, their vibrant wings carrying them on new journeys. Despite the change, their friendship remained steadfast, a symbol of unwavering support and love.

And so, in that enchanting garden, the tale of Ivy and Oscar spread, reminding everyone that true friendship knows no boundaries. It teaches us to lift each other up, to embrace our differences, and to find strength and joy in the company of a trusted companion.

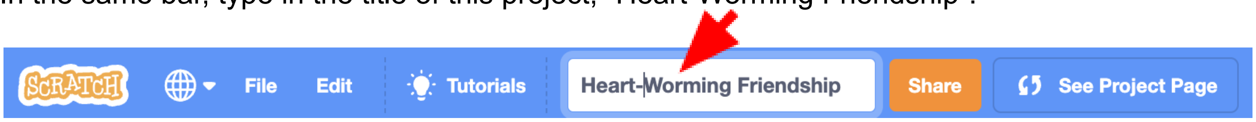
Please log onto Scratch now by typing the following link into an Internet browser. Remember to keep your username and password safe!

scratch.mit.edu

1. Select “Create” from the top bar.



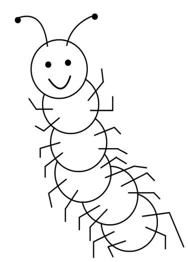
In the same bar, type in the title of this project, “Heart-Worming Friendship”.



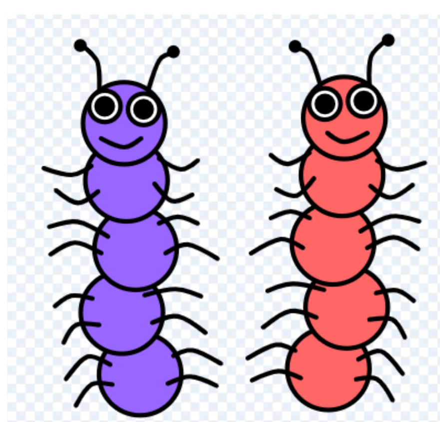
In the bottom right, delete the Scratch the Cat sprite by clicking on the “X”.

In the last lessons you learned how to create characters (or sprites), make the characters move and talk, and how to design new backdrops in the Scratch interface.

Using what you learned so far in the Scratch block-based language, animate the story on the previous page. You will need to create the two characters, Ivy and Oscar; make them look any way you want, but it might best if you designed these sprites as if you were looking at them from their front (see below).



2. When you have finished designing the characters in the story, take a screenshot of them and place them into the labeled boxes below.

Ivy sprite  **Oscar sprite**

<u>Part II</u>: "Jitterbugs"

Alex and Jordan are sibling ladybugs who live with Ivy and Oscar in The Vibrant Garden. While visiting their grandparents, they heard about the "Jitterbug" dance. Read on to find out how this dance, formerly known as the lindy hop, came to be.

The lindy hop was "invented" in the late 1920s at Harlem's Savoy ballroom. In a competition before a big press contingent, its top dancer, "Shorty" Snowden, threw off his partner and did a quick "breakaway" of fancy footwork. "It's the Lindy," Shorty said, referring to Charles Lindbergh's recent transatlantic flight. Shorty's hop, later known as the Jitterbug, was as powerful as the legendary aviator's.

The lindy's African roots were highlighted during the Harlem Renaissance. However, the lindy was most remarkable for what it wasn't. The lindy was neither waltz or foxtrot, popular dances of the time, and those who danced it recognized they were part of a culture that no longer accepted white middle class norms. It was a complete break from that tradition and an attempt to escape the middleclass order and structure that kept African Americans down. The dance's amazing breakaways helped hoppers escape social restraints. In jazz dances of the time, Detroit lindy dancer Ernie Smith said, "I suppose you could call those mill-town girls lower class, but they could really dance." In fact, at the time, it looked that "lower class" girls were better dancers!

Late 20th-century Harlem was a tough neighborhood with few police, and several "secret gangs" developed to enforce vigilante law and order. These gangs would later become street gangs.

The Savoy ballroom was not immune to this new gang mentality. Shorty and the other finest dancers called the northwest corner of the ballroom the "cat's corner," and anyone not dancing there would be "whipped and tromped up in the crowd."

The lindy protocol seemed to extend the dance's possibilities. Lindy hoppers created new rules and broke social class barriers. Benny Goodman and big band swing made the dance a national phenomenon by 1936. As it expanded across the nation, the lindy lost its original feelings and eventually became known as the jitterbug.

White middle-class Americans, once challenged by social upheaval that inspired the dance, no longer recognized its origins. The jitterbug was danced in high school cotillions alongside the waltz and foxtrot, and mainstream white America accepted the lindy's social message.

Alex and Jordan have decided they would like to learn how to do the “Jitterbug”.

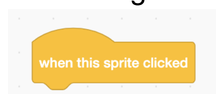
Type the following link in an Internet browser and watch the short video clip, called “How to Jitterbug/Beginner Steps”. (You might try learning these steps for yourself as you watch the video!).

https://www.youtube.com/watch?v=trqXu5es84U

Now that you have seen some of the steps involved in the “Jitterbug”, it’s time to design sprites of Alex and Jordan and choreograph them dancing! Use your coding skills to show the two ladybugs doing some of the moves in the “Jitterbug”.

Before you begin, answer the following questions or do what is stated.

A. Why would you want to use this code block as your starting block this time rather than this one ?



If we use the “when this sprite is clicked” block, the ladybugs will not be in sync with each other when dancing.

Return to your Scratch account and start a new project. Be sure to title this project, “Jitterbugs”.

1. Create your new sprites.

2. Animate your sprites to do the steps in the Jitterbug dance.

3. Add music to your animation. Open this link for Big Band (jazz) music.

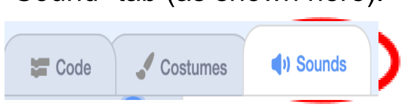
https://freemusicarchive.org/genre/Big_BandSwing

Explore the song clips and find one that you like for your Alex and Jordan ladybugs to dance to.

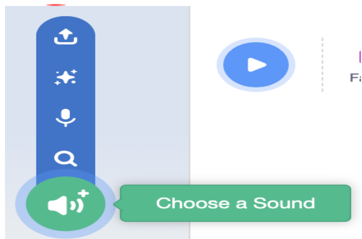
To download the song clip that you like, choose this button (located to the right).

Once the song has downloaded, the .mp3 file will be located in the downloads folder on your computer.

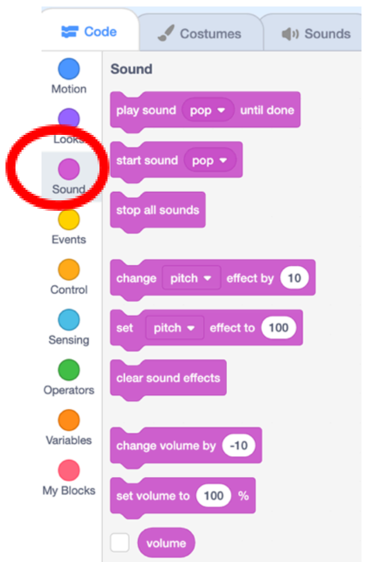
In Scratch, select the “Sound” tab (as shown here).



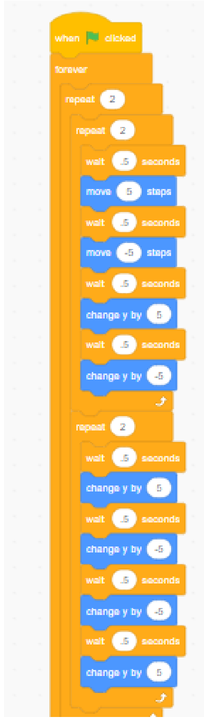
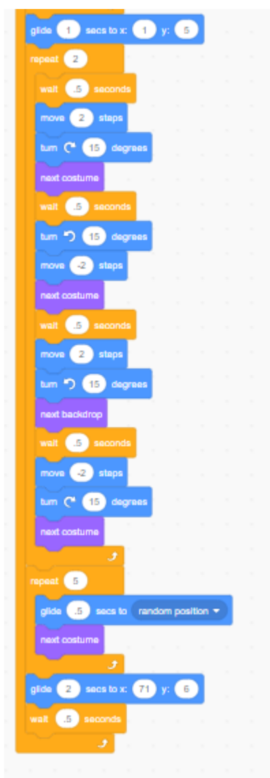
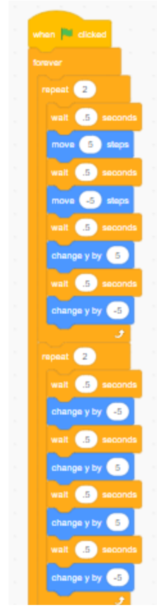
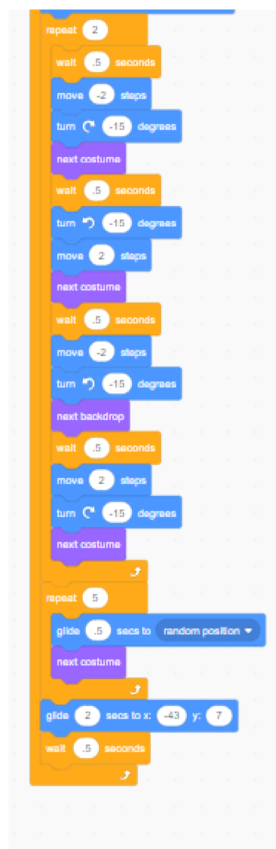
Hover your mouse over the “Add a sound” button, and select the following.



Find the .mp3 file (of the song clip you chose) and select it. You can now use this song clip in the pink sound blocks (as shown below).



When you are finished coding your Alex and Jordan ladybugs, take a screenshot of both codes and place them in the box on the next page.

	Code Blocks for Alex	Code Blocks for Jordan
Screenshot of Project Blocks/Code	  *code may be too long to fit in one image*	 
Shared Project Link	xx	

EXTEND YOUR THINKING: **The 'Enigma' of Alan Turing**

Read the following excerpt about Alan Turing and answer the questions that follow on your own.

Alan Mathison Turing was a mathematician and computer scientist from Britain who lived at the beginning of the 20th century. He made important advances to mathematics, computer science, and philosophy, including making a mathematical model of how growth and development happens in embryos. This model of biological growth became a key part of world-wide study into how embryos grow and develop.

Turing was born to Julius Mathison Turing and Ethel Sara Stoney in the upper middle class on June 23, 1912, in London. In 1931, at the age of 19, Turing enrolled in King's College, Cambridge, to study math, and he finished with honors in 1934. Because of his outstanding work on probability theory, he was made a fellow of King's College in 1935.

Turing could have easily stayed in the field of mathematics, but he chose to switch to the field of logic and began to study the "decision problem" of David Hilbert. The Entscheidungsproblem (Ent-shyd-oongs-prob-luhm) asks if there is a surefire way to figure out if a mathematical statement can be shown to be true or false. Alonzo Church, an American logician, released his answer to the Entscheidungsproblem just before Turing could make his results public. Since their methods were different, Turing chose to publish his article "On Computable Numbers, with an Application to the Entscheidungsproblem" in the Proceedings of the London Mathematical Society in 1936. The universal Turing machine was first written about in this paper, which made it well-known in the area of computer science.

The universal Turing machine is a mathematical model of a machine that can read the description and data of another machine and then simulate it. Simply put, the universal Turing machine works the same way that a computer does. A computer reads a program (called an input), runs it, and then makes something called an output. In the same way, the universal Turing machine reads the description of another machine, simulates it, and makes an output. By describing the universal Turing machine, Turing explained how an electric computer could work before it was even invented.

In September 1936, Turing started working on his PhD at Princeton University in New Jersey, and his assistant was actually Alonzo Church. John von Neumann, a mathematician, offered Turing a job as an assistant at Princeton after he left school in the fall of 1938, but Turing chose to go back to England. John von Neumann would become best known for his work in the early days of computers. As the director of the Electronic Computer Project at Princeton's Institute for Advanced Study nearly a decade later, John von Neumann would create MANIAC, which at the time was the fastest computer of its kind.

Now in England, at the start of World War II in 1939, Alan Turing joined the British government's communication center at Bletchley Park, the Government Code and Cypher School. There, he made important advances to breaking the Germans' Enigma code, which at first seemed impossible to crack. Turing was able to work with large-scale digital electronic machines at Bletchley Park. In 1943, he started working on a form of the universal Turing machine that could be used in real life. He was impressed by how fast and reliable it was. By the end of World War II, Turing had a plan for just this kind of machine, which we now call an electronic computer.

In October 1945, Turing started working at the National Physical Laboratory (NPL), which is near London. There, he was able to build the universal Turing machine he had planned. Unfortunately for Turing, engineering problems with the machine's hardware made it difficult to execute software, which was the most important part of his idea. Turing was so upset by this that he moved to Manchester University in 1948 to become the deputy head of the Computing Laboratory there. In this role, he was able to secure money from the Royal Society and hire engineers with more experience, which got the first version of his machine up and going quickly.

During his time at the NPL, Turing began to think about and write about artificial intelligence. He theorized that tasks that could be done by a computer could be like human intelligence. In 1950, his famous article "Computing Machinery and Intelligence" was released in the journal Mind, which is about philosophy. In this study, he described the Turing Test, which is a method to determine if a machine can be thought of as intelligent. The Turing Test became an important part of the field of AI.

Alan Turing was chosen as a Fellow of the Royal Society in 1951 when he started to think about a scientific way to explain morphogenesis (the process by which an organism gets its shape). The Philosophical Transactions of the Royal Society of London released his paper "The Chemical Basis of Morphogenesis" in 1952. In this piece, Turing talks about a mathematical model that is used to explain how patterns and structures like fur patterns and limbs can form in an embryo. Turing stated that morphogens are chemicals found in the cells of an embryo that help shape the way it grows. Turing was one of the first people to try to understand morphogenesis using math. "The Chemical Basis of Morphogenesis" became a key piece of information for future study on this subject. He was also one of the first people in this field to use computers to scientifically support his work.

Turing continued working on his theory of how patterns are made, and he tried to determine why certain numbers, called Fibonacci (Fi-buh-nah-chee) numbers, show up in the patterns of plant leaves. He also started to learn more about quantum physics.

Turing was awarded the Most Excellent Order of the British Empire (OBE) for his work at Bletchley Park during World War II. The Association for Computing Machinery (ACM) started giving out the Turing Award every year in 1966, twelve years after he death. This award, the most important one given by the ACM, is given in honor of Turing, who was one of the first people to study computers. Hugh Whitemore was also moved by Turing's life to write a play about him called "Breaking the Code." The first time this play was put on was in 1986, and it was later made into a TV movie. Even though Turing died when he was only 42 years old, he made very important contributions to many areas of science, technology and math.

1. What major contributions did Alan Turing make to the field of computer science?

   Turing created the Turing machine and the Turing test.

2. What was the significance of Turing's article "On Computable Numbers, with an Application to the Entscheidungsproblem"?

   Turnings article introduced the foundational idea of an electric computer as we know them today; explaining the way the outputs of the Turning machine changed based on the inputs it receives.

3. How did Turing's work at Bletchley Park contribute to breaking the Germans' Enigma code during World War II?

   Turning applied the power of large-scale digital machines to the task of breaking the Germans Enigma code which helped immensely in the progress of the British.

4. How do you think Alan Turing's work on artificial intelligence and the Turing Test have

changed how we think about human intelligence and how we build smart machines?

The Turing test allows for the unbiased comparison of a machine's intelligence and a humans. Even today when testing a computer's capabilities, we compare it to a person. This test continues to allow us to do just that

5. Turing did research on morphogenesis and attempted to explain the presence of Fibonacci numbers in plant leaf patterns. Where else do you think there is a link between math and the natural world? Explain.

   The human body provides many examples of math in the natural world, from indicators of height to the production of cells.

If time permits, share your thoughts about Question #5 with the class.