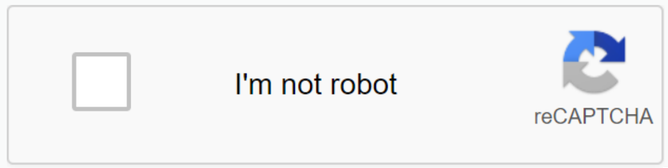

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Answers for code.org lesson 7

In this lesson students are introduced to the pull loop, one of the basic programming paradigms in Game Lab. To begin the lesson, students look at some books of physical flipbooks to see that having many frames with different images creates the impression of movement. Students then watch a video explaining how the drawing loop in Game Lab helps create the same impression in their programs. Students combine the drawing loop with random numbers to manipulate some simple animations with dots and then with sprites. At the end of the lesson, students use what they have learned to update their sprite scene from the previous lesson. Purpose Drawing Loop is a basic component of Game Lab. The fact that the Game Lab environment repeatedly requests this function several times per second (by default 30) is what allows the tool to create animations. This lesson therefore has two objectives. The first is for students to see how animation generally depends on the display of many slightly different images in a sequence. To help students have physical flipbooks that they can use, a video, and a map level. The second goal is for students to understand how the drawing loop allows them to create this behavior in Game Lab. Students should let the lesson let the understanding that the commands in the drawing loop are named after all the other codes, but are then repeatedly named at a frame rate. Students will have the chance to continue to develop an understanding of this behavior in the next two lessons, but establishing a strong conceptual basis in this lesson will serve them well for the rest of the unit. Agenda Warm Up (5 minutes) Activity (60 min) Wrap Up (10 minutes) Video: Show Flipbook Example - by Marnic Bos - Video Prompt: This video shows a flipbook to make animation. Does it work in your own words? Why is it fooling our eyes into thinking something's moving? Purpose of discussion: This discussion should introduce some key understandings about animation. Students should understand that the key is to see many images in a row that are slightly different. Enter the word vocabulary frame as one of these images. Then switch to the fact that soon students will be creating their own animations. Discuss: Ask students to write their ideas independently, then share with partners, then as a whole group. Vocabulary: Frame: A single image in an animation Observations We will begin to learn to make animations, not just static images. To do this we need a way to make our programs shoot many images a second. Our eyes will slow them down to make it look like a smooth movement. To do this, though, we will need to learn a new Important Teaching Type Pair Programming: This lesson introduces a challenging new paradigm. Until students are working to improve their projects consider having them pair program. Remember to give students clear instructions about when to switch the driver and navigator. Video: Video: Video introduction of the drawing loop Map Level: Briefly students at the map level following the video. Ask students to use it as a reference as they complete the challenges in today's work. Demo: If you choose, use the random dot Flipbook condition - Manipulators and Random Sprite Flipbook - Manipulators to provide a manipulative hands-on for exploring how the loop pulls and animations are connected. Share: Students just need to make small changes to their projects (for example, shaking a single sprite), but ask them to share with a neighbor or as a full class Objective Discussion: Use these requests to assess whether students have understood the main learning objectives of the lesson. Key understandings: There are many common misconceptions with the pull loop. Make sure students understand the following Drawing Loop runs according to all other codes in the program. It doesn't really matter where it is located in your loop program the pull is run by Game Lab at a constant frame rate of 30 frames per second. You don't actually need to call the function yourself. Frames in Game Lab can be considered transparency sheets. Unless you draw a background, then all new shapes or sprites will simply appear on top of the old ones You should only have a loop pull in the program promptly: Have students respond to the following requests What is an animation? Why does the drawing loop help us make animations? What are some common errors or mistakes should we look for as we keep programming with the loop shoot? Review: Return to the resources students saw at the beginning of the lesson (Map Level, Video, physical flip books) and address the misconceptions that appeared in the lesson. CSTA K-12 Computer Science Standards (2017) AP - Electromagnetics & Programming 2-AP-11 - Create clearly designated variables that represent different types of data and perform operations on their values. 2-AP-12 - Design and develop iterative programs that combine control structures, including nested loops and compound conditionalities. 2-AP-13 - Breaks down problems and sub-problems into parts to facilitate the design, implementation, and revision of programs. 2-AP-16 - Embed existing code, media files, and libraries in original programs and assign. 2-AP-17 - Systematically test and refine programs using a series of test cases. 2-AP-19 - Document programs to make them easier to track, test and troubleshoot. In this online activity, students will be able to push their understanding of loops to a whole new level. Playing with bee and plants vs Zombies, students will learn to program a loop to be inside another loop. will also be encouraged to figure out how few changes in each loop will affect their schedule when you click Run. Aim In this introduction to nested loops, students will go outside their comfort zone to create more effective effective to puzzles. In previous puzzles, the loops pushed the students to recognize repetition. Here, students will learn to recognize patterns in repeated patterns to develop these nested curls. This stage begins by encouraging students to try to solve a puzzle where the code is irritating and complex to write the long way. After a video inserts nested loops, students are shown an example and asked to predict what will happen when a loop is placed inside another loop. This progression leads to a lot of practice for students to solidify and build on their understanding of looping in programming. Agenda Warm Up (10 min) Main Activity (30 min) Wrap Up (15 min) Review briefly with the class of what loops are and why we use them. How are the curls? Loops repeat a set of commands. (see custom vocabulary if students don't recognize it) do we use the loops? We use loops to create a pattern made up of repeated actions. Tell the class that they will now do something super cool: using loops inside the loops. Ask the class to predict what kind of things we use a loop inside a loop. If a loop repeats a pattern, then looping a loop would repeat a pattern of patterns! Students don't need to understand this right away, so feel free to switch to online puzzles, even if students still seem a little confused. I highly recommend the programming pair - Student Video in this lesson. This may not be an easy topic for most of your students. Working with a partner and discussing potential puzzle solutions could make students' minds easier. They also have paper and pencils nearby for students to write their plan before coding. Some puzzles have a limit on the number of certain blocks that you can use, so if students want to write the long answer to find repeats, paper can be useful. The fact that students are writing about what they have learned, why it is useful, and how they feel about it can help solidify any knowledge they have gained today and build a review sheet to look to in the future. Log Requests: What was today's lesson about? What do you think of today's lesson? What is a nested loop? Can you draw a puzzle that would use a nested loop? Try encoding the solution to your own puzzle. CSTA K-12 Computer Science Standards (2017) AP - Electromagnetics & Programming 1B-AP-11 - Break down (decompose) problems into smaller and manageable subissues to facilitate the program development process. As we begin to write longer and more interesting programs, our code often contains a lot of repetitions. In this lesson, students will learn about how can be used to communicate more easily instructions that have a lot of repetition by looking at repeated patterns of motion in a dance. Purpose At this point in the course, students should have developed comfort by programming a set of linear instructions. Frequently linear set of instructions models that are repeated several times and as students want to write more complex and interesting programs, manual duplication this code becomes cumbersome and ineffective. To allow students to write stronger programs, we will have to rely on structures that come out of that unique linear list. Loops allow students to structure their code in a repeating way. In this lesson, we will focus on identifying patterns in physical motion before moving back on your computer to search for patterns in our code. Warm Up Agenda (5 min) Main Activity (15 min) Rating (10 min) Wrap-Up (15 min) Extended Learning Model: Ask a volunteer and ask them to stand. Instruct your volunteer to walk around the table (or in their chair or on a friend). When they're done, instruct them to do it again, using exactly the same words you've done before. When they're done, train them again. Then again. Prompt: Would it have been easier for me to ask you to walk around the table four times? Think about it: what if I wanted you to do it ten times? Did you reformulate my instructions so that they would be more effective and I didn't have to repeat myself that much? Feel free to write your instructions down on a scrap piece of paper. Share: Ask a few students to share their instructions with the class, highlighting how each approach has simplified the general approach to giving instructions. Today's observations we will work on finding ways to make a lot of instructions easier, especially when these instructions are repeated a lot. This will be very useful when we go back to computers and have to write a lot of instructions in our programs. Dance Party Lesson Tip: Looking for some good music? Here are some great places to find some: Disney Radio Nick Radio Kidz Bop Radio Please be informed that some of these stations may display ads with third-party content. If you find that the ads shown are inappropriate, you might want to direct students to another site or search for blocking ads that might prevent this content. Say: Enter the main activity by letting the class know that we're having a dance party. To have that party, we're going to need to know what all the steps are in the dance and how many times we should do them. Show: Show the Getting Started - Worksheet worksheet so that all students can see it. Speak through different sections of dance as a class. Highlight the repeating section in particular. Model: Show the class shows the entire dance done at full speed. Then run through the dance slowly, asking a different student to shout each line of instructions. Then ask the students to sing the dance with you, saying out loud as they reach every move. Prompt: Ask students to work with a neighbor to find all sections of the repeating dance. Share: Ask a few students to share the repeatable patterns that As a class, I speak by how you might rework the instructions to be even shorter by repeating these patterns. Finally, help them understand a symbology for capturing these loops on their image program, because the evaluation will use the same method. Here's an example: Ending with an evaluation sheet will help solidify this lesson for your students. Distribute: Hand in Loopy Basics - Rating for each student. Allow students to complete the work independently after the instructions have been well explained. This should feel familiar due to previous activities. Display: Presents vocab for this lesson, loop. Ask the class to emphasize the main loop that was in the dance. Why do you think we call it a loop? Flash Chat: What did I learn? Do you think it is easier to add more pictures to the screen or change the number of times I loop? Would your answer be the same if we wanted to do a loop 100 times? Could we use the same curls with different dance moves? Do you know of any dancing that is done in a loop? What was your favorite part about this activity? Journaling that students are writing or drawing about what they have learned, why it is useful, and how they feel about it can help solidify any knowledge they have gained today and build a review sheet to look at in the future. Log Requests: What was today's lesson about? did you feel it during today's lesson? Draw a picture of you dancing today. Draw the loops you've made, would be the applause three times. What else can you use a loop for? Use these tasks to improve student learning. They can be used as outside of class activities or other enrichments. So move give students pictures of actions or dance moves that they can do. Ask students to arrange movements and add loops to choreograph their own dance. Share your dances with the rest of the class. Connect It Back Find some YouTube videos of repeating folk dances. Can your class find the loops? Try the same thing with songs! CSTA K-12 Computer Science Standards (2017) AP - Electromagnetics & Programming 1A-AP-09 - Models how programs store and manipulate data using numbers or other symbols to represent information. 1A-AP-10 - Develop programs with simple sequences and loops to express ideas or address a problem. 1A-AP-11 - Break down (decompose) the steps needed to solve a problem in a precise sequence of instructions. 1A-AP-14 - Troubleshoot (identify and fix) errors in an algorithm or program that includes simple sequences and loops. This list represents opportunities in this lesson to support standards in other content areas. Core English Language Arts Standards L - Language 2.L.6 - Use words and phrases acquired through conversations, reading and reading texts, including using adjectives and adverbs to describe (for example, When other children are happy, that makes me happy). SL - - & Listening 2.SL.1 - Participate in collaborative conversations with various partners about topics and texts of the 2nd degree with colleagues and adults from small and larger groups. 2.SL.6 - Produce complete sentences, where appropriate, at the task and situation, to provide the required details or clarifications. Common Core Math Standards MP - Math Practices MP.1 - Make sense of problems and persevere in solving their MP.2 - Abstract reason and quantitative MP.5 - Use appropriate tools strategically MP.6 - Participate to precision MP.7 - Look for and make use of the structure MP.8 - Watch and express regularity in repeated reasoning OA - Operations and algebraic thinking 2.OA.1 - Use plus and decrease within 100 to solve word problems with one and two steps involving situations of adding to , taking, gathering, dismembering and comparing, with unknowns in all positions, for example, by using drawings and equations with a sy Next Generation Science Standards ETS - Engineering in the Sciences ETS1 - Engineering Design K-2-ETS1-1 - Ask questions, make observations, and gather information about a situation that people want to change to define a simple problem that can be solved by developing a new or improved object or tool. K-2-ETS1-2 - Develop a simple outline, design, or physical pattern to illustrate how the shape of an object helps it function as needed to solve a particular problem. K-2-ETS1-3 - Analyze the data from the tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. Performs.