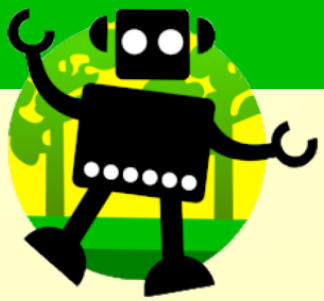
Module 4 - Activity 12:
The Glue Balloons



Overview
Create code to control a zapper gun using a variety of controls which can be used to shoot down balloons.

Computing PoS Reference
- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

Learning Objective
- Learn how several sprites can be programmed individually and used to achieve one end result; including use of repetition in the form of forever blocks and broadcast blocks to trigger another program.

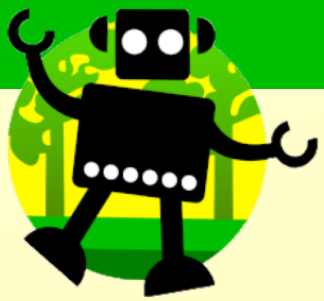
Success Criteria
All: I can create code for several sprites to achieve one end result.
Most: I can create code for several sprites to achieve one end result and I can explain how a broadcast block is used to trigger another program.
Some: I can create code for several sprites to achieve one end result and I can explain how and why a broadcast block is used to trigger another program and explain the difference between repeat and forever loops.

Key Words
event, key pressed, control, input, motion, point in direction, point towards, point in direction, forever, continuous, loop, sprite, broadcast, debug.

Computer Science Concepts
- Algorithm design.
- Debugging.
- Control.
- Input/output.
- Loops.
- Broadcast.

Cross Curricular Concepts
- Mathematics: angles, estimation.

Activity 12: The Glue Balloons



Introduction

Share the learning objective and the success criteria. Explain to students that they are going to create programs for more than one sprite using blocks from EVENT, MOTION, and CONTROL to solve a problem using code.

EXPLORE: As a class, go through the first few screens. Explain that the glue balloon sprite is programmed by the bad robot and that the laser bolt sprite is programmed by Dr Han, meaning we aren't able to create or adjust the code for these sprites. The students will be programming the zapper gun and the aiming sprite.

Q: Can you identify the sprites which rely on one another to shoot down a glue balloon?

Discuss how each of these elements will work. i.e. the aiming sprite needs to move around to point to the target, in this case a glue balloon. What does the zapper gun need to do? Consider that the laser bolt is a separate sprite. Discuss decomposition (the act of breaking down a problem into smaller parts).

Q: Will you be creating code for all of these sprites?

Together, look at the code for the aiming sprite until you reach the point in direction block.

Q: If 90 is the same as right, what do you think will be the value for up, left and down?

Click on (90) right and look at the values, discuss. Add in the remaining direction blocks.

Q: How do you know which direction to change to? Did this code do what you expected it to?

Add in the move blocks to all then test how far the aiming sprite moves.

Q: Can you explain why a much higher number would not be better?

Test and discuss.

CHALLENGE: In pairs, students work through the activity, programming the zapper gun and playing the game to shoot the glue balloons.

EVALUATE: Discuss whether a repeat block could be used to achieve the same outcome as a forever block.

Q: What would happen when the space key is pressed if we used a Repeat block instead? Will it still broadcast? Why? Which category does the forever block belong to? Why do you think it belongs to the control category?

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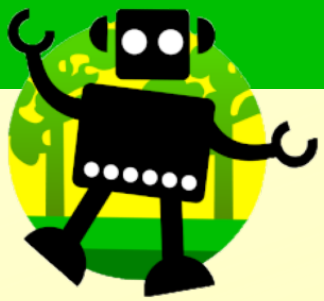


SEN Support

Students to work in mixed ability pairs.

Resources

- Answer Sheet.

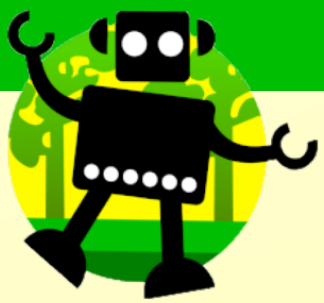
Extension Activity

OFFLINE ACTIVITY: using the information that they already know having programmed the zapper gun, students use decomposition to work out code that might make the laser bolt work.

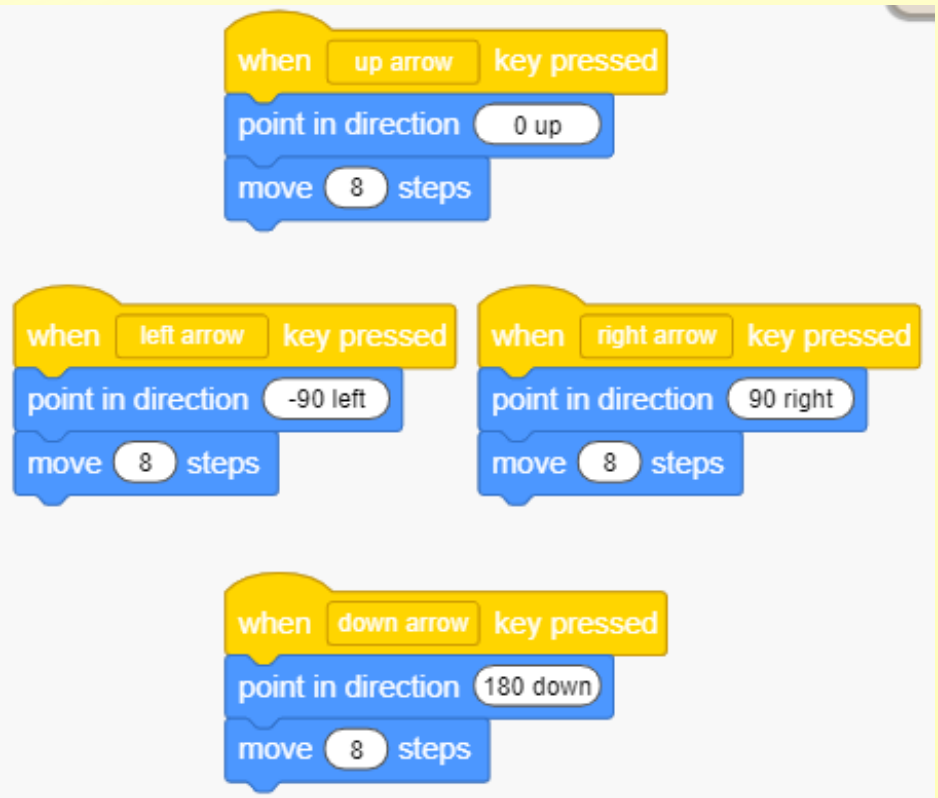
Possible Key Questions For Assessment

What did you learn about coding today?
Can you explain what the problem was that we had to solve and how we solved it?
Which new event block did we use today and why was this block particularly useful?
Can more than one program be created to control the same sprite? How do we know?
Why is this useful?
How did we use estimation? (Movement of aiming sprite)
Why do you think the broadcast block is in the events category?
Were there any opportunities to debug?
Is there a difference between point in direction of and point towards? Explain.

Activity 12: Answer Sheet



Aiming sprite code. Note: the values on the move blocks can be different.



Zapper gun sprite code.