



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

200
1822 - 2022

Moving straight

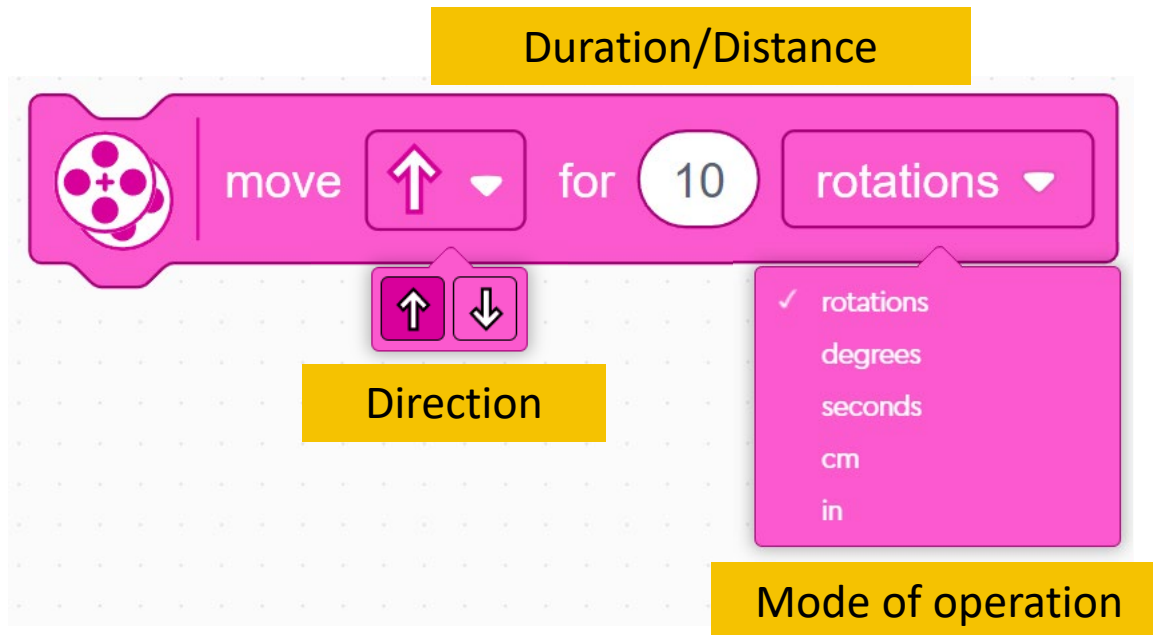
Man Geni Addysg Uwch yng Nghymru
Where Higher Education Began in Wales

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Lesson Objectives

- Learn how to make your robot go forward and backwards
- Learn how to use the Move blocks
- Use any driving base of your choice from build in spike prime app

Move for Duration

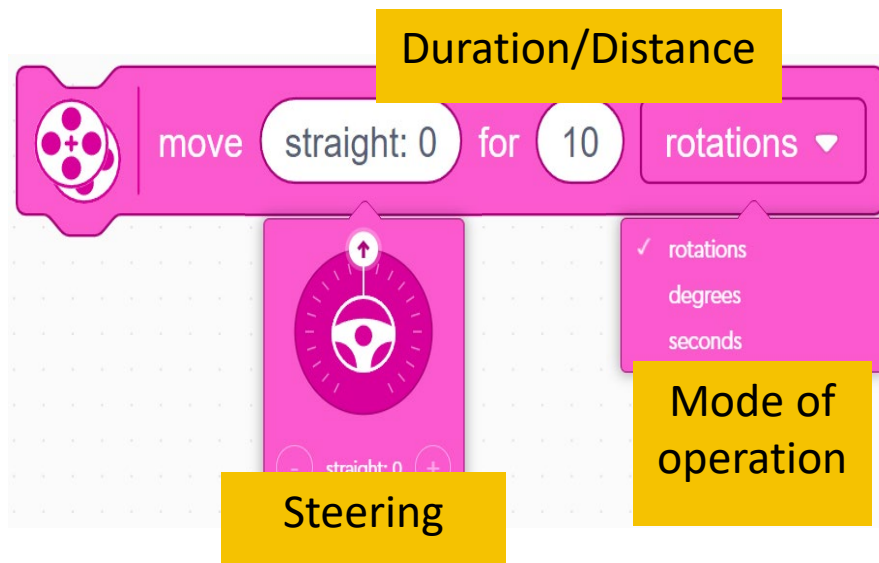


Set in Configuration

To use this block you will set the speed, stop mode, motor ports, wheel size (see Configuring Robot Movement Lesson)

- Simplest move block – just gives control over direction and distance
- Other move blocks give control over speed and steering

Move with Steering for Duration



Set in Configuration

To use this block you will set the speed, stop mode, motor ports, wheel size (see Configuring Robot Movement Lesson)

- This block allows you to control the move distance and turning of the robot.
- This block provides control over steering by allocating varying amounts of power to the left and right wheels. When set to "straight: 0" steering, equal power is supplied to both wheels, resulting in straight movement for the robot. Setting it to "right: 100" and "left: -100" allocates full power to both wheels but in opposite directions, causing the robot to spin either to the right or to the left.

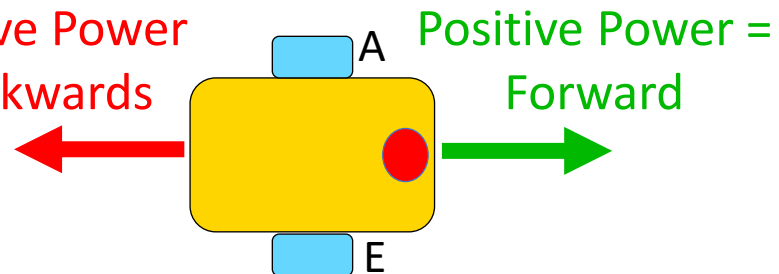
NEGATIVE Values

- You can enter negative values for power or distance
- This will make the robot move backwards
- If you negate two values (e.g. power and distance, or distance and backwards direction), the robot will move forward.

Negative Power =
Backwards



Negative Power
= Backwards

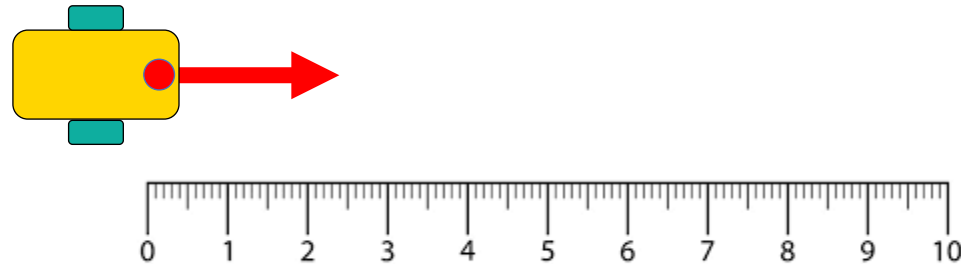


Positive Power =
Forward



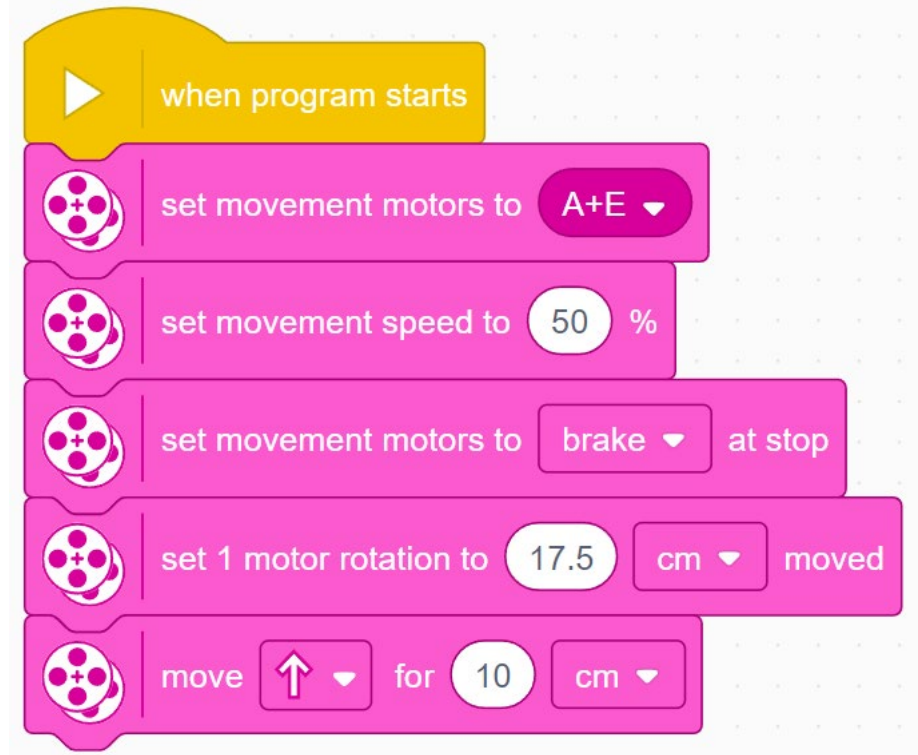
Challenge 1: Move 10 CM

- Move the robot 10 centimeters forward
- Basic steps:
 - Configure your robot
 - Use a Movement Block (Move Tank or Move For Duration block) and move forward for 10cm



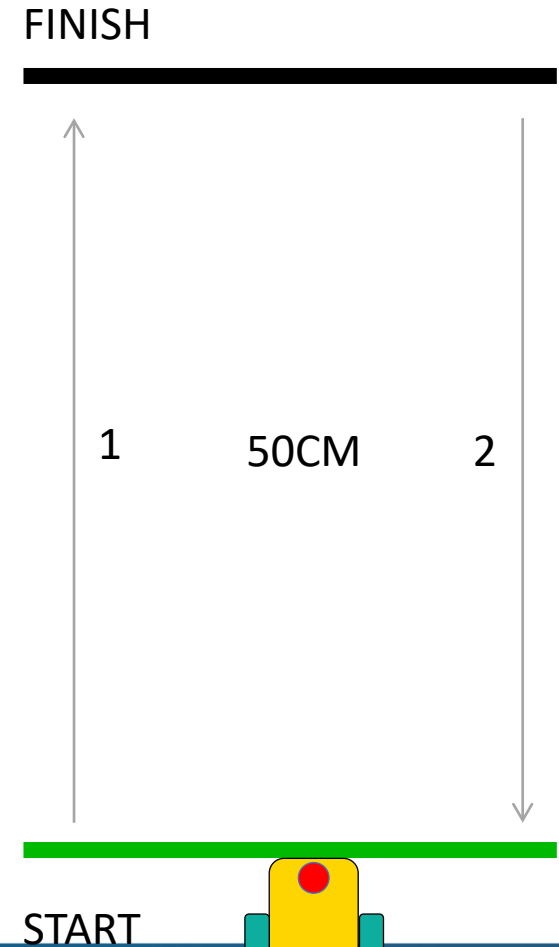
Challenge 1 possible solution

- Configure your robot
- Move forward for 10 cm. The same cm mode is available in other move blocks.



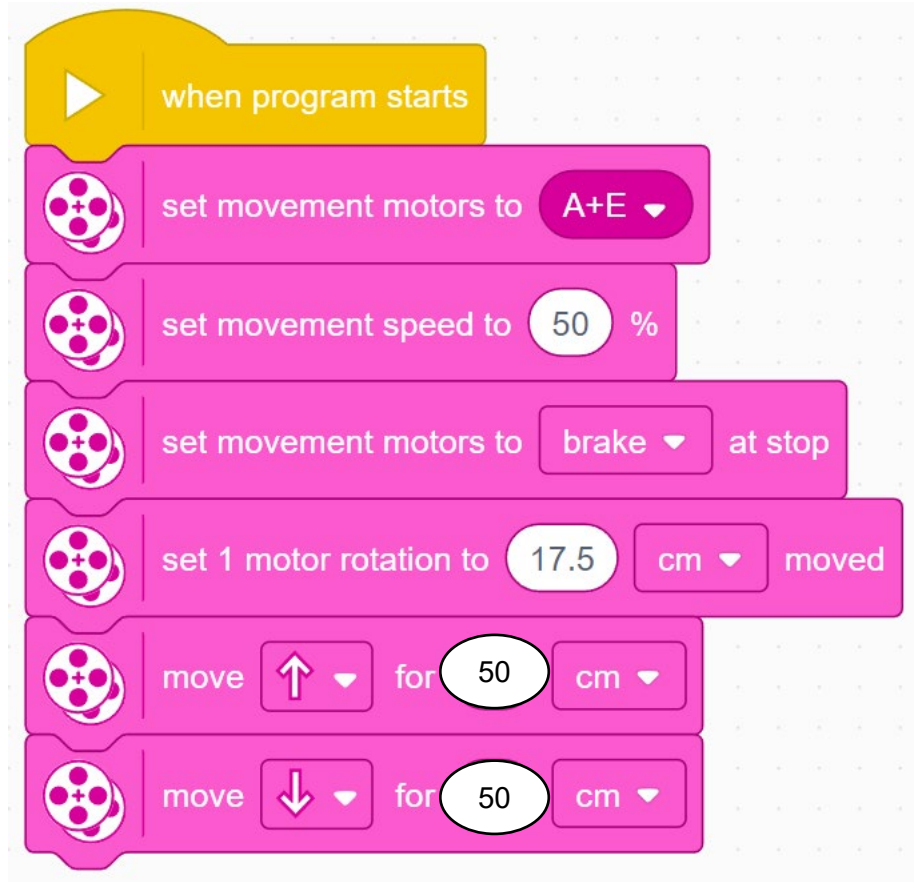
Challenge II: Move Forward and Back

- Move your robot forward from the start line to the finish line (1) and back to the start (2)
- Basic steps:
 - Configure your robot
 - Use a Movement Block and move forward for the desired amount (50cm)
 - Use the same Movement Block to move backwards (50cm)

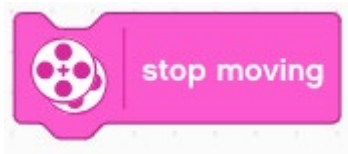
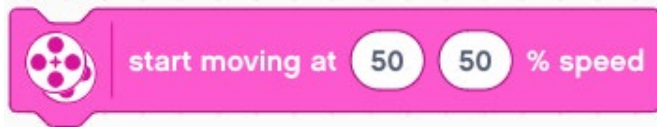
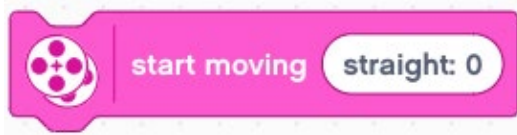
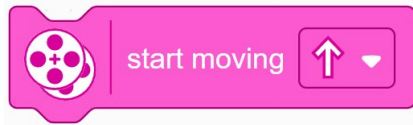


Challenge II solution

- Configure your robot
- Robot moves forward 50cm and backwards 50cm

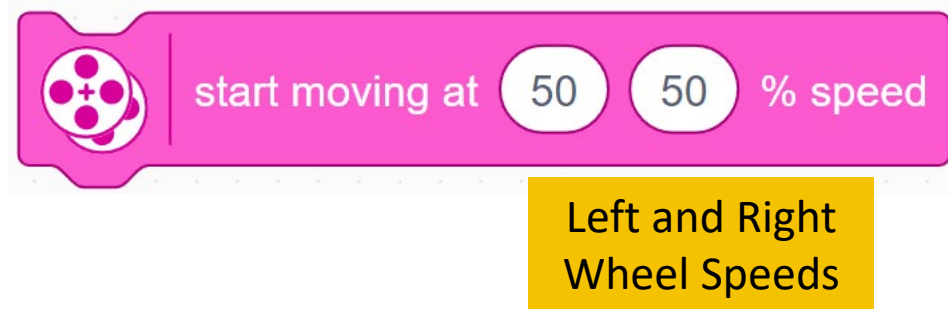


Start Moving and Stop Moving Blocks



- There are 4 more move blocks in the Movement palette.
- The Start moving blocks will turn **on** your drive motors at the given speed (and steering if given).
- These blocks have no duration/distance. After turning the motor on, the program instantly moves to the next block
- The motor will continue running until stopped or controlled by another block
- Stop moving will halt your drive motors no matter what action they are running.

Start Moving at Speed (“Move Tank”)



Set in Configuration

To use this block you will set the motor ports (see Configuring Robot Movement Lesson)

- In this block you control the two motor speeds independently. This is often called tank controls.
- This Block must be added to your Block Palette using Extensions. It is in the More Movement Palette.

Wait blocks and Challenge iii

- Since Start and Stop Moving blocks execute instantly, they need to be used with other blocks to be made useful. One common way they are used is with Wait Blocks. Wait Blocks hold up the program execution until some event occurs. The lessons on sensors cover Wait Blocks in more detail.
- For now, we will use the Wait for Seconds block



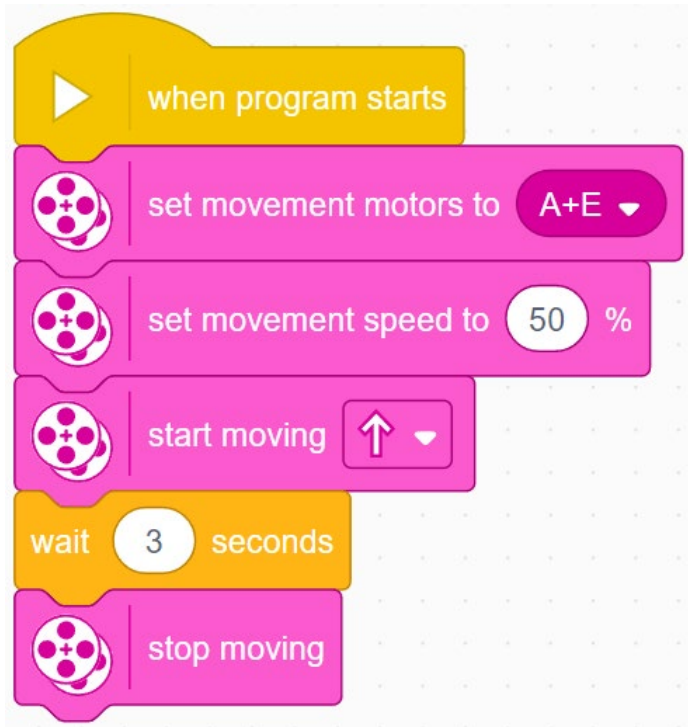
- This block takes the entered number of seconds to run

Challenge III:

Use Start Moving, Stop Moving and Wait blocks to make the robot move forward for 3 seconds

Challenge III: moving For 3 Seconds

- Can you Move 3 Seconds using just the Start Moving and Wait blocks?



- The Start Moving block starts the robot moving
- After turning on the motors, the program begins running the Wait block. This takes 3 seconds to run.
- The Stop Moving block makes the robot stop

Next Week

- Accurate Turning

CREDITS

- *Steam lesson plans for all ages* (no date) *LEGO® Education*. Available at: <https://education.lego.com/en-us/lessons/?products=SPIKE%E2%84%A2%2BPrime%2BSet> (Accessed: 06 February 2024).