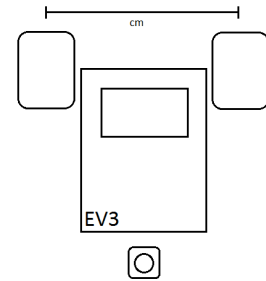


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**Predict and Plan**

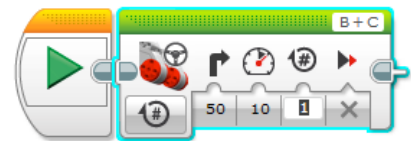
Have your robot drive forward 1 rotation of the wheel. Measure the exact distance it travels forward. **17.4** \_\_\_\_\_ cm

Measure the width of your robot. **12.0** \_\_\_\_\_ cm  
(Centre of one tire to the centre of the other tire).



**Demonstrate/Design/Discover**

- ✓ Remember  $\pi = \text{Circumference}/\text{Diameter}$  (as stated earlier)
- ✓ Using a steering block set to 50% right and 10% power to draw a circle with the outside tire.
- ✓ Using trial and error, set the rotations so your robot turns around exactly once. Record it here **4.1** \_\_\_\_\_ rotations.
- ✓ Using the three numbers you have collected so far, calculate your estimate of  $\pi$ . **Use the 6 problem solving steps described in the learn section. Show your work.**



**Circumference =  $4.1 \times 17.4 = 71.34$  cm**

**Diameter =  $12 \times 2 = 24$  cm**

**$\pi = 71.34/24$**

**$\pi = 2.97$**

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- ✓ Tips: Leave your robot plugged in and hold the wire up to save time in testing.
- ✓ Make sure to use the DIAMETRE (not the radius)

**Record**

*Put rough work in here. Show your final answer and all steps above.*

**Questions**

Questioning 1  
Math

How many rotations would you need for a  $\frac{1}{2}$  turn and a  $\frac{3}{4}$  turn?

$4.1 \times \frac{1}{2} = 2.05$  rotations  
 $4.1 \times \frac{3}{4} = 3.075$  rotations

Question 2  
Math

Get the actual value of  $\pi$  from your teacher. Comment on how close you were, and why you may have been a bit off.

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Question 3  
Math

If the width of your vehicle was larger, would this have changed your value for  $\pi$ ? Explain.

**No, the ration C/D is always the same for any circle. 3.14**



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Question 4 Math	One of the numbers we have already recorded is the circumference of your robots wheels. Rearrange the equation $\pi = C/D$ to figure out the <i>diameter</i> of your robots wheels.
$\pi = C/D$ $D = C/\pi$ $D = 17.4\text{cm}/3.14$ $D = 5.53 \text{ cm}$ <hr/> <hr/> <hr/>	
Question 5 Robotics/Math *bonus challenge* (difficult)	If you wanted to move exactly 20 cm. a) How many rotations would you need to use using your tires? b) How many would you need to use if the tires were 10cm tall?