

TRAINING TASKS

EV3



This workbook belongs to :

Name

School

EV3 WORKBOOK 1

SECTION 1 – INTRO ACTIVITIES

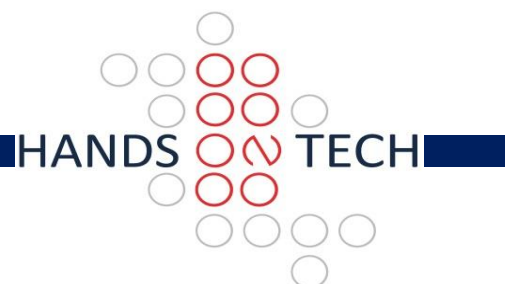
Pg		Main Areas		± Times	Need / Model / Sensors			Group
1	Intro	EV3 Bricks	Ports & Buttons	5 mins				
2	Intro	Sensors	Touch Sensor	10 mins				
3	Intro	Sensors	Gyro Sensor	5 mins	Build	rotating base	gyro	
4	Intro	Sensors	Gyro Sensor	10 mins	Build	rotating base	gyro	Partner
5	Intro	Sensors	Gyro Sensor	15 mins	Build	rotating base	gyro	Partner
6	Intro	Sensors	Colour Sensor	5 mins			colour	
7	Intro	Sensors	Colour Sensor	15 mins	Build	bracket	colour	Partner
8	Intro	Sensors	Colour Sensor	15 mins	Build	cuboid	colour	
9	Intro	Sensors	Ultrasonic Sensor	20 mins	Build	rotating base	ultrasonic	
10	Intro	Sensors	Ultrasonic Sensor	10 mins	Build	cuboid	ultrasonic	
11	Intro	Sensors	Ultrasonic Sensor	15 mins	Build	rotating base	ultrasonic	Partner
12	Intro	Sensors	Ultrasonic Sensor	15 mins	Build	rotating base	ultrasonic	Partner
13	Intro	Sensors	Rotation Sensor	5 mins	Build		motor	
14	Intro	Sensors	Rotation Sensor	10 mins	Build		motor	
15	Intro	Sensors	Rotation Sensor	10 mins	Build		motor	Partner
16	Intro	Sensors	Rotation Sensor	10 mins	Build		med motor	
17	Intro	EV3 Software	Desktop	5 mins				
18	Intro	EV3 Software	Programming Palette	5 mins				
19	Intro	Sensors	Rotation Sensor	15 mins	Disc	protractor	motor	
20	Intro	Sensors	Rotation Sensor	15 mins	Disc	protractor	motor	Partner
21	Intro	Sensors	QTask 1 & 2	15 mins	Disc	protractor	motor	
22	Intro	Sensors	Rotation Sensor	15 mins	Build	hand generator	motor	



± 245 mins

www.handson-tech.co.za

May only be reproduced or used under copyright agreement. ©



EV3 WORKBOOK 1

SECTION 2 – LOGIC TASKS

Pg	Task #	Main Areas		E	M	D	± Times	Need / Model / Sensors			Group
23	Task 1	Display	text	•			5 mins				
23	Task 2	Display	images	•			5 mins				
23	Task 3	Display	shapes	•			10 mins				Partner
23	Task 4	Sound	various	•			10 mins				Partner
24	Task 5	Wait		•			10 mins	Build		touch / motor	

Parallel Sequence

25	Task 6	Wait	parallel sequence	•			5 mins	Build		touch	
25	Task 7	Wait	sensor input	•			15 mins	Build		all sensors	
25	Task 8	Loop		•			5 mins	Build		touch	
25	Task 9	Loop	# of times	•			5 mins	Build			
25	Task 10	Loop	until	•			5 mins	Build			
26	Task 11	Loop	until input	•			5 mins			colour	
26	Task 12	Loop Interrupt		•			10 mins			colour	
26	Task 13	Loop	sound & light		•		10 mins				
26	Task 14	Loop	sound & light		•		10 mins				

Switch

27	Task 15	Switch	2 inputs	•			5 mins			colour	
27	Task 16	Switch	inside a loop		•		10 mins			colour	
27	Task 17	Switch	with input		•		10 mins			colour / touch	
28	Task 18	Switch	3 inputs (+ case)		•		10 mins			colour	
28	Task 19	Switch	7 inputs		•		15 mins			colour	
28	Task 20	Flat/Tabbed	view	•			5 mins				
29	Task 21	Switch / Loop / Parallel			•		15 mins	Disc	B&W	colour	
29	Task 22	Switch / Loop			•		15 mins	Disc	RGY	colour	
29	Task 23	Switch / Loop / Parallel			•		15 mins	Disc	RGYB	colour	
29	Task 24	Switch / Loop / Parallel			•		20 mins	Disc	RGYB	colour	
29	Task 25	Switch / Loop / Parallel / Sound			•		10 mins	Disc	RGYB	colour	

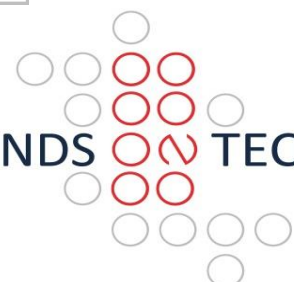
± 240 mins



www.handsontech.co.za

May only be reproduced or used under copyright agreement. ©

HANDS ON TECH



EV3 WORKBOOK 1

SECTION 3 – DRIVING TASKS

Pg	Task #	Main Areas	E	M	D	± Times	Need / Model / Sensors	Mat	Group
30	Task 26	Drive <i>forward / backwards</i>	●			5 mins	Driving Base		
30	Task 27	Drive <i>rotations / time</i>	●			10 mins	Driving Base	●	
30	Task 28	Drive <i>rotations</i>	●			10 mins	Driving Base	●	
30	Task 29	Drive <i>rotations / time</i>	●			10 mins	Driving Base	●	
31	Task 30	Drive <i>turn</i>	●			10 mins	Driving Base	●	
31	Task 31	Drive <i>turn</i>	●			15 mins	Driving Base	●	Race #1
31	Task 32	Drive <i>until input</i>	●			15 mins	Driving Base <i>colour</i>	●	
31	Task 33	Drive <i>until input</i>	●			10 mins	Driving Base <i>colour</i>	●	
31	Task 34	Drive control	●			5 mins	Driving Base	●	Race T
32	Task 35	Drive control <i>square</i>	●			15 mins	Driving Base	●	Partner
32	Task 36	Drive control <i>figure of 8</i>		●		20 mins	Driving Base	●	
32	Task 37	Drive control <i>base to base (btb)</i>	●			20 mins	Driving Base	●	
32	Task 38	Drive control <i>btb / object</i>		●		25 mins	Driving Base	●	
33	Task 39	Drive control <i>btb / object</i>		●		30 mins	Driving Base	●	
33	Task 40	Drive control <i>avoid object / sensor</i>		●		30 mins	Driving Base <i>ultrasonic</i>	●	
33	Task 41	Drive control <i>square / sensor</i>		●		30 mins	Driving Base <i>gyro</i>	●	
34	Task 42	Drive control <i>btb / object</i>		●		30 mins	Driving Base	●	MC - KO
34	Task 43	Drive control <i>push btb</i>		●		30 mins	Driving Base	●	MC - B2B
35	Task 44	Drive control <i>line follower</i>		●		20 mins	Driving Base <i>colour</i>	●	
35	Task 45	Drive control <i>line follower</i>		●		20 mins	Driving Base <i>colour, +</i>	●	
35	Task 46	Drive control <i>line follower</i>		●		20 mins	Driving Base <i>colour</i>	●	
36	Task 47	Drive control <i>line follower x 2</i>		●		25 mins	Driving Base <i>colour, +</i>	●	Partner
36	Task 48	Drive control <i>course navigation</i>		●		25 mins	Driving Base	●	Race T
37	Task 49	Drive control <i>course navigation, +</i>			●	30 mins	Driving Base <i>all</i>	●	Race T
37	Task 50	Drive control <i>colour navigation</i>			●	30 mins	Driving Base <i>colour</i>	●	Partner

Rotating Base - Building Instructions



±	490	mins
---	-----	------

www.handsontech.co.za

HANDS ON TECH

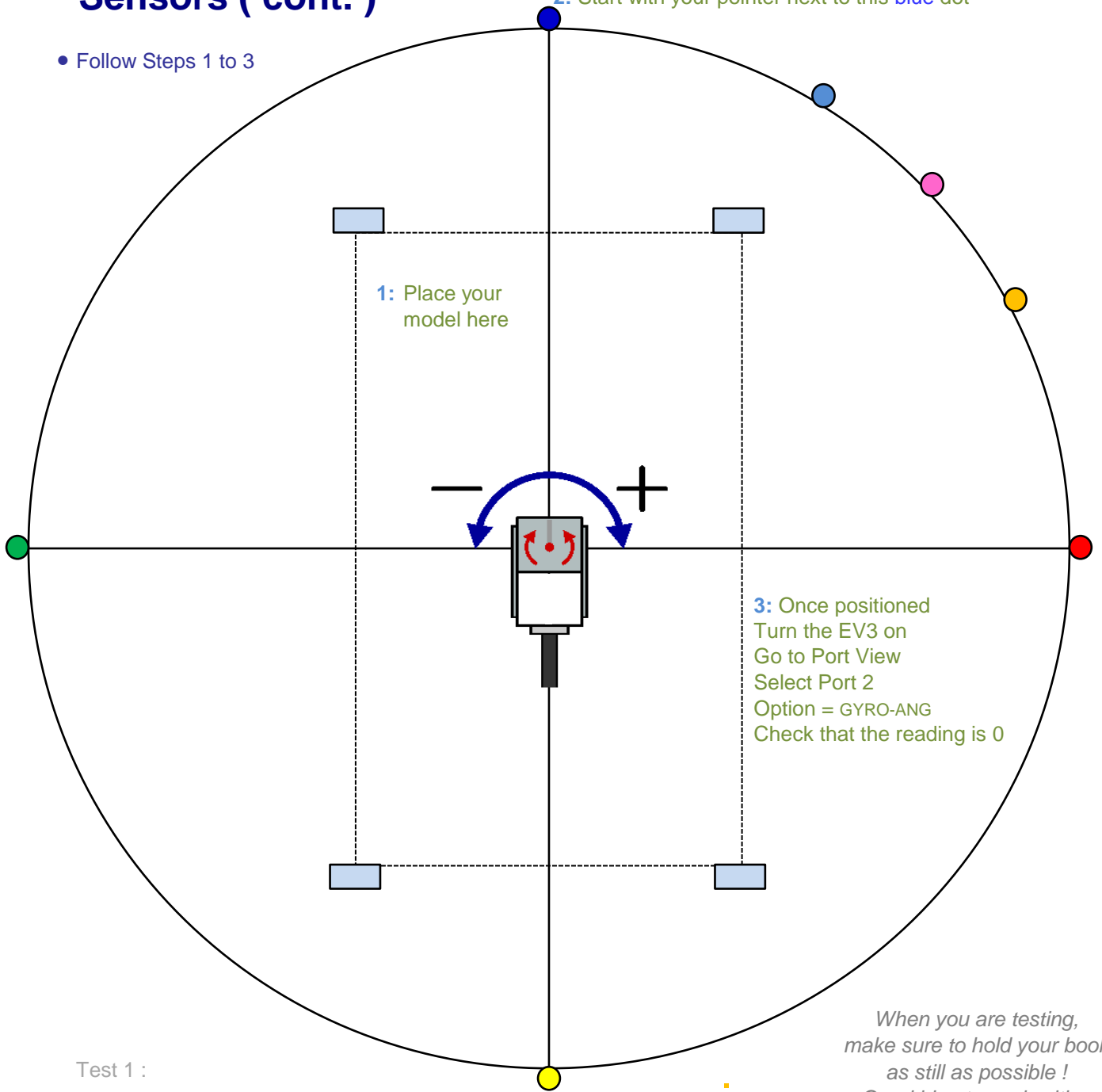
May only be reproduced or used under copyright agreement. ©



Sensors (cont.)

- Follow Steps 1 to 3

2: Start with your pointer next to this blue dot



Test 1 :

- Move the pointer to the light blue dot.
What value do you see on the screen ?
- Move the pointer back to the blue dot.
What value do you see on the screen ?

Test 2 :

- Make sure you start each test with a reading of 0.
(If your reading is not 0 and you want to reset it to 0, unplug the sensor at Port 2, and then replace it)
- Move to the light blue dot. What value do you see?
- Move to the blue dot. What value do you see?

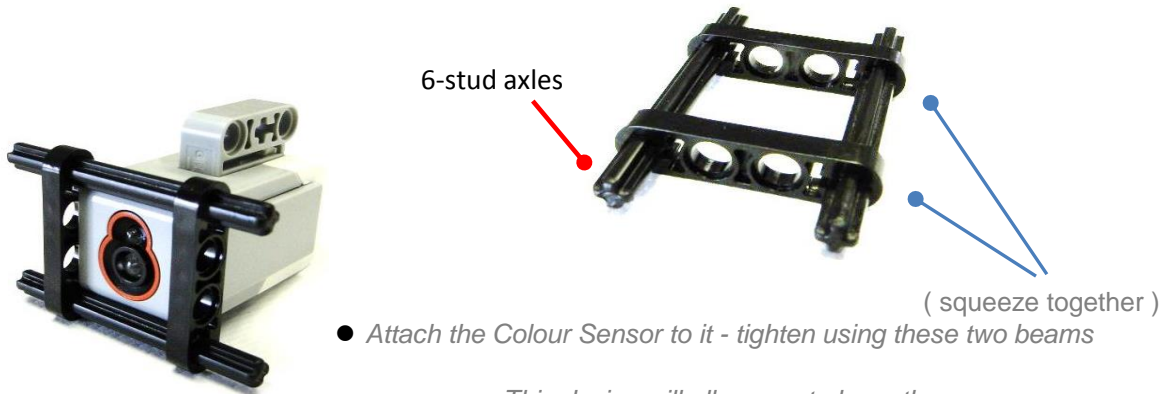
When you are testing, make sure to hold your book as still as possible ! Good idea to work with a partner for this exercise - record in one book and test in the other - then transfer results.

Test 2 :

-
-

Sensors (cont.)

Build : *this bracket for the next few activities*



This device will allow you to keep the sensor off the page and at a constant distance from the colours you are testing.

Connect the Colour Sensor to Port 3
 Use Port View
 Use the appropriate option to complete the following

- Place the Colour Sensor on top of each strip and record the reading for each.

COL-REFLECT	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
COL-COLOR	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

What colour 'reflects' the lowest value ? Value

What colour 'reflects' the highest value ?

Are there any colours that are different, but have the same values ? Y N

- Test the strip below using the COL-COLOR option.

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	COL-COLOR

No colour
 Test by pointing
 into the air.

How many colours can the Colour Sensor identify ?

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

EV3 Software - Programming Palette

- The Programming Palette contains all the blocks that can be used to :
 - design a program to control a robot.
 - design an experiment to be carried out by

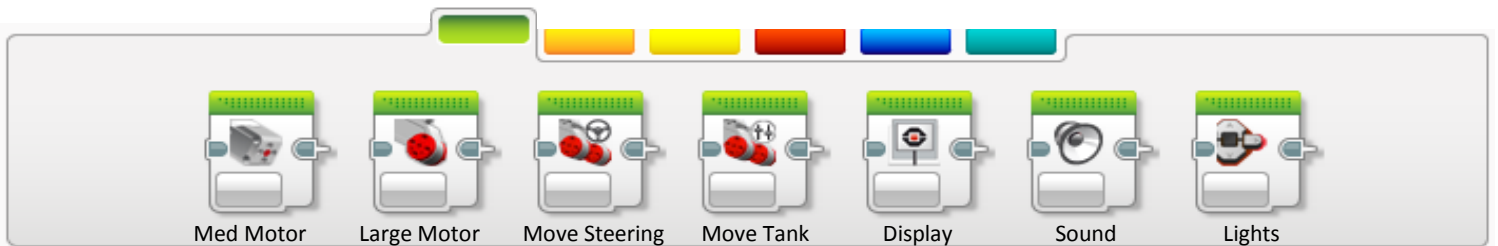
- Blocks are colour coded according to type and nature.

Here are the first 3 palette options (other 3 will be dealt with later)

GREEN

Action Blocks

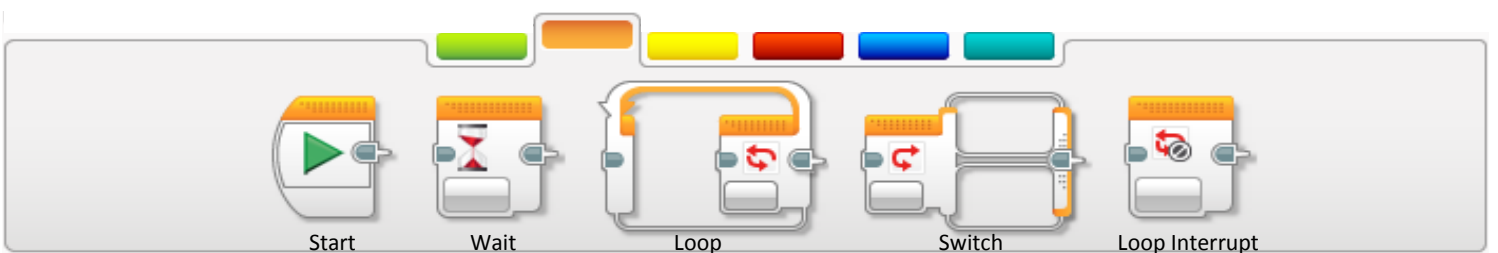
(go - do something - switch on / off)



ORANGE

Flow Blocks

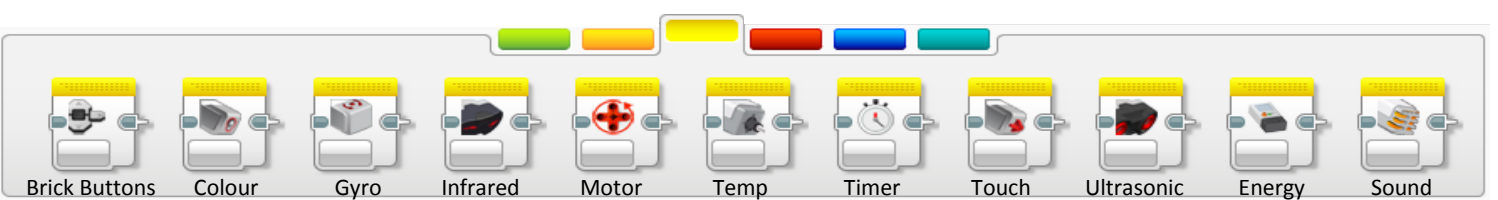
(wait - wait for - control a program)



YELLOW

Sensor Blocks

(get info from a sensor)



- Ways to input / change data for a block :

