

2023-2024 Quality Education Fund Thematic Network - Tertiary Institutes

STEAM Education with Self-directed and Progressive Learning of Engineering Design Process for Problem-solving

透過STEAM教育自主及循序漸進學習以工程設計流程解難

Sound test

荃灣天主教小學 Tsuen Wan Catholic Primary School

OBJECTIVES OF EXPERIMENT

- To compare the effect of soundproofing of different sound insulation materials

EXPERIMENT MATERIAL



Sponge



Towel



Cotton



Tone Generator

R8050



EXPERIMENT



RESULT

Hz	N/A (dB)	Sponge (dB)	change	Towel (dB)	change	Cotton (dB)	change
N/A	45.1	38.3	-6.8	37	-8.1	37.6	-7.5
300	45.8	42.3	-3.5	39.5	-6.3	41.5	-4.3
600	62.5	62.3	-0.2	49.9	-12.6	55.8	-6.7
900	74.6	59.7	-14.9	54.5	-20.1	57.2	-17.4

OBJECTIVES OF EXPERIMENT

- A) To compare sound meter apps on different device with Professional device R8050 in different distance
- B) To compare the sound meter level difference with the sound source place on the table and on the sponge by using different devices

EXPERIMENT PHOTO



RESULT

distance (on table)	R8050	iphone	calibrati on	ipad	calibrati on	samsun g	calibrati on
0	73	74	-1	62	11	78	-5
0.5	51	56	-5	41	10	58	-7
1	51	55	-4	39	12	57	-6
1.5	50	55	-5	39	11	54	-4
2	48	52	-4	36	12	56	-8
2.5	50	53	-3	35	15	53	-3
/	/	/	Average -3.67	/	Average 11.8	/	Average -5.5

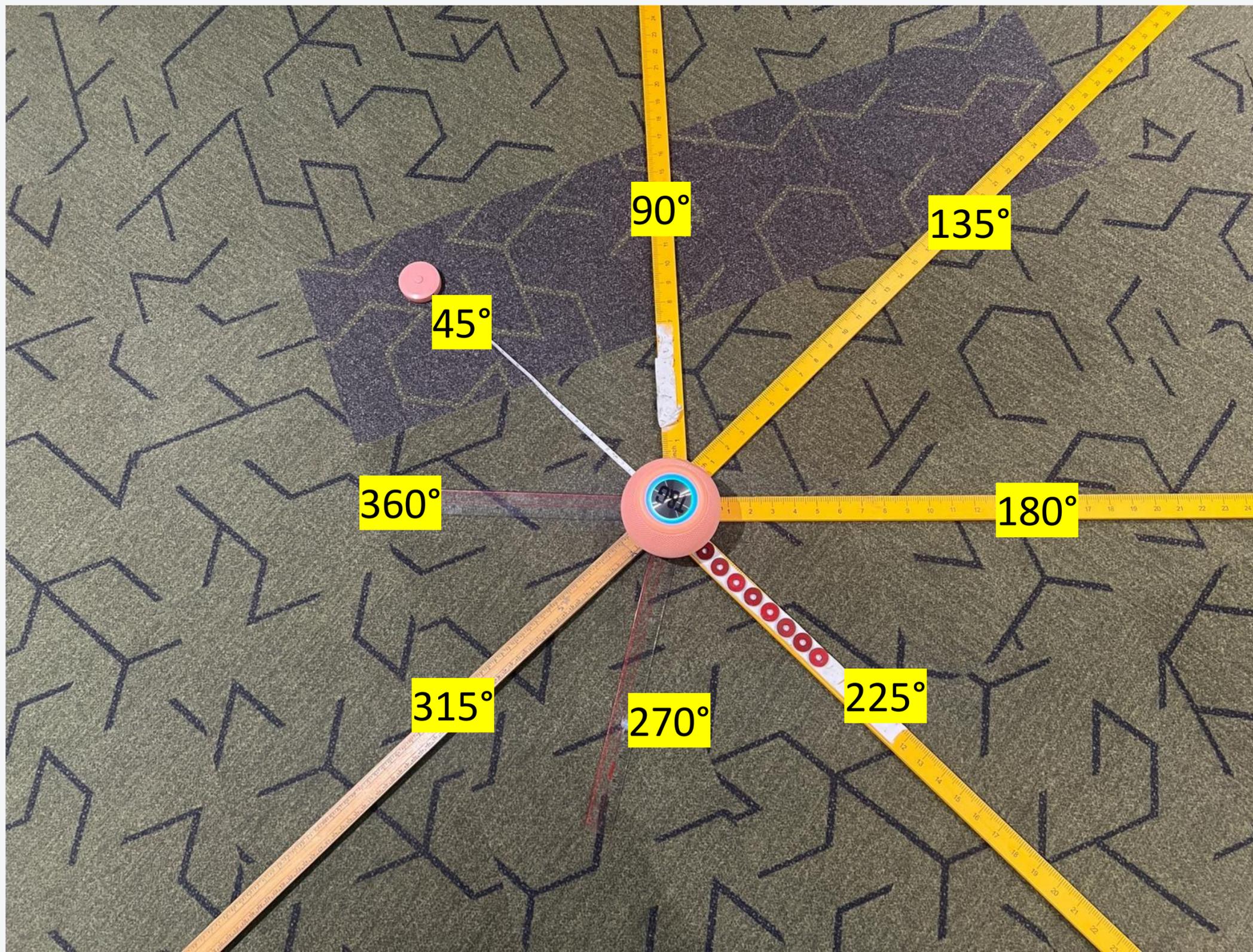
RESULT

distance (on sponge)	R8050	iphone	calibration	ipad	calibration	samsung	calibration
0	59	57	+2	49	+10	58	+1
0.5	54	50	+4	39	+15	51	+3
1	48	49	-1	36	+12	48	0
1.5	45	47	-2	34	+11	47	+2
2	45	49	-4	41	+4	48	+3
2.5	43	48	-5	33	+10	46	+3
/	/	/	Average -1	/	Average 10.3	/	Average 2

OBJECTIVES OF EXPERIMENT

- To test the sound level (360°) of the speaker by using R8050

EXPERIMENT



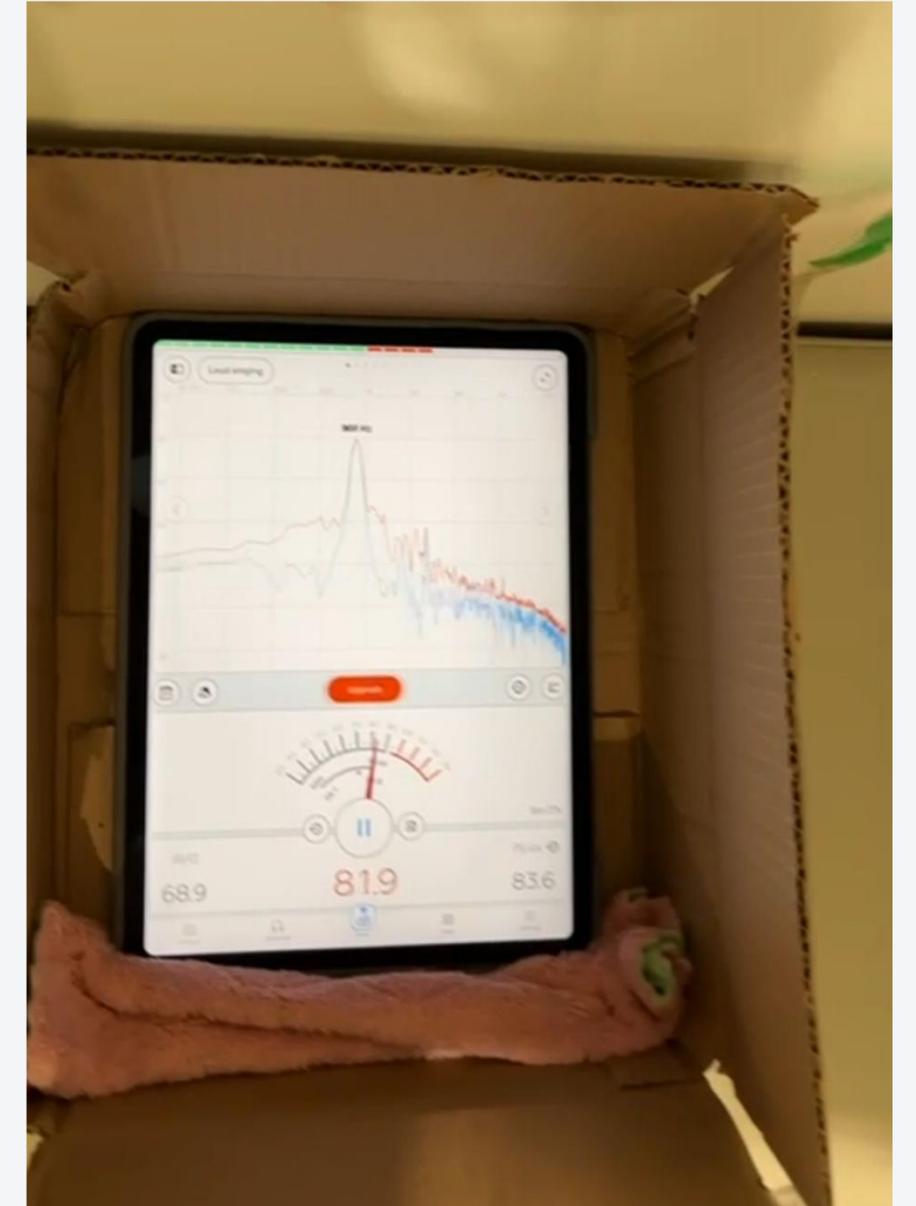
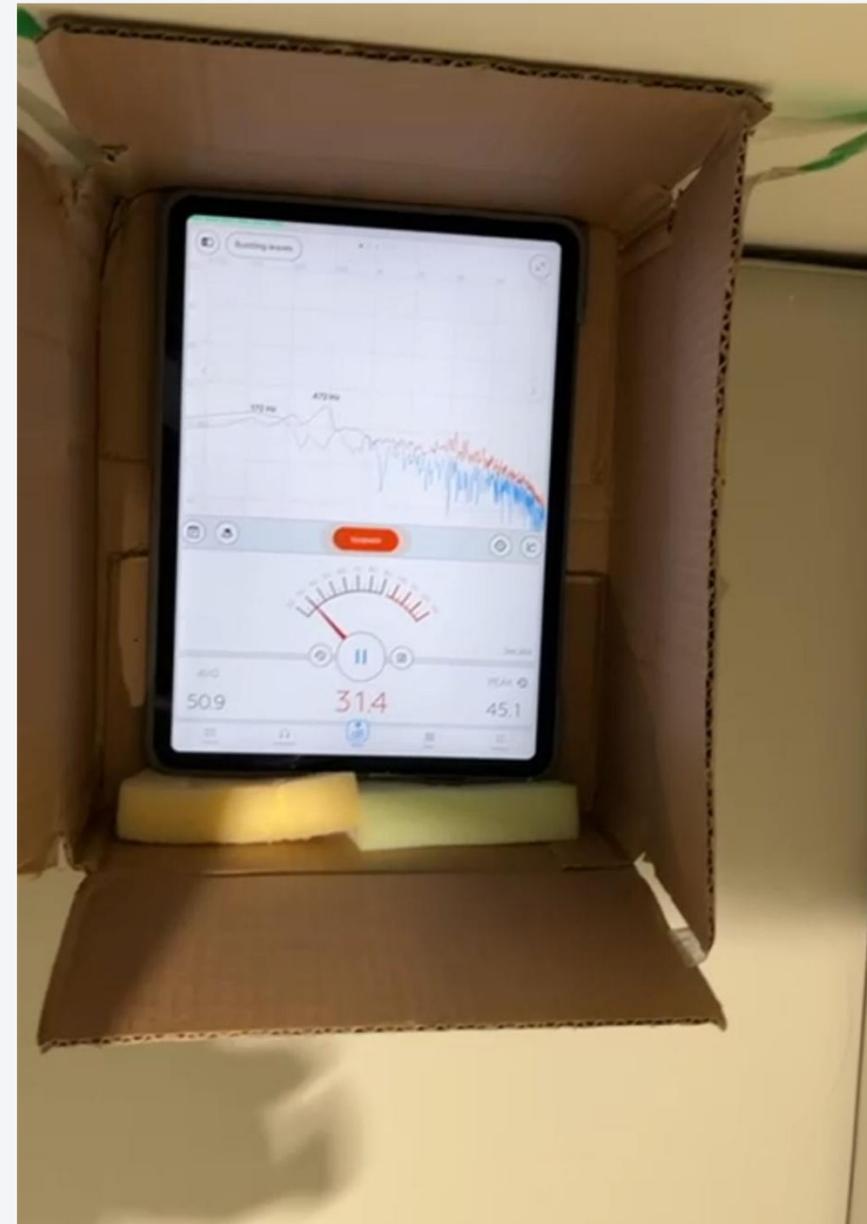
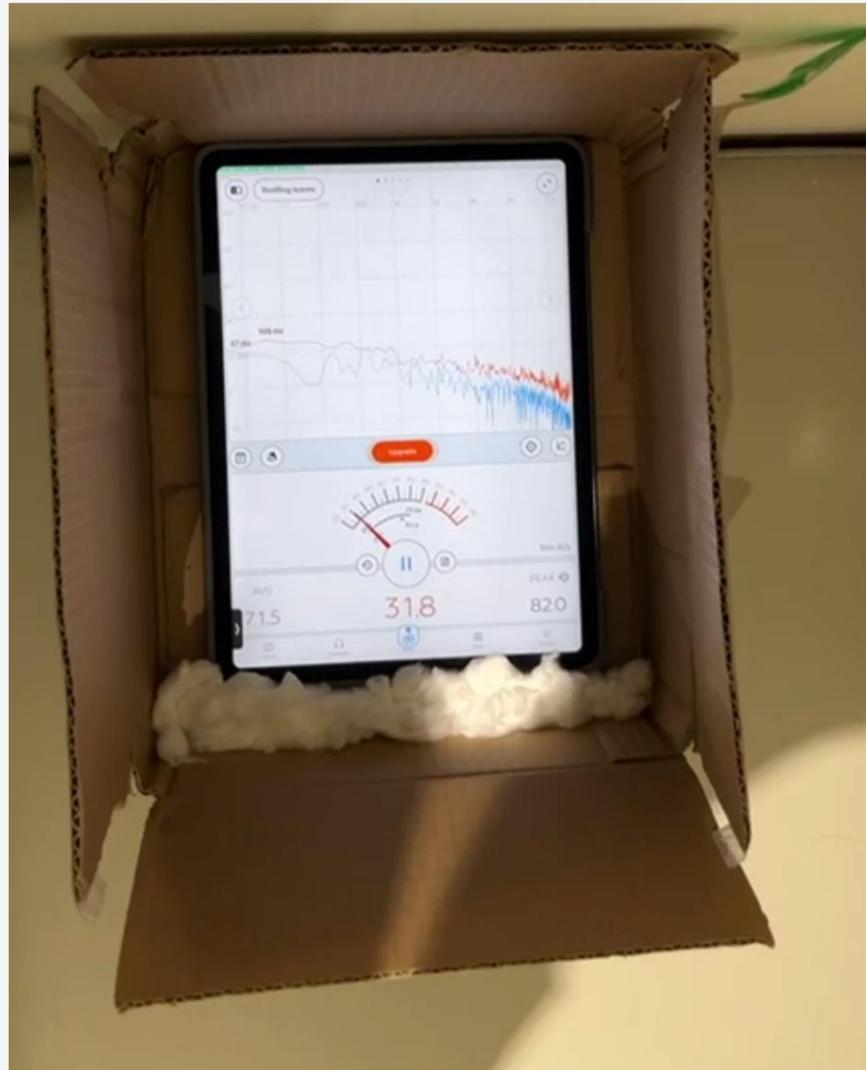
RESULT

		Average (dB)								
Hz	inch	45°	90°	135°	180°	225°	270°	315°	360°	
300	12	84	84	88	90	90	86	86	87	
600	12	84	86	91	93	96	90	85	87	
900	12	84	90	91	97	98	95	85	92	
900	0	93	93	98	107	112	111	103	95	

OBJECTIVES OF EXPERIMENT

- To compare the effect of soundproofing of different sound insulation materials (box only)

EXPERIMENT



RESULT

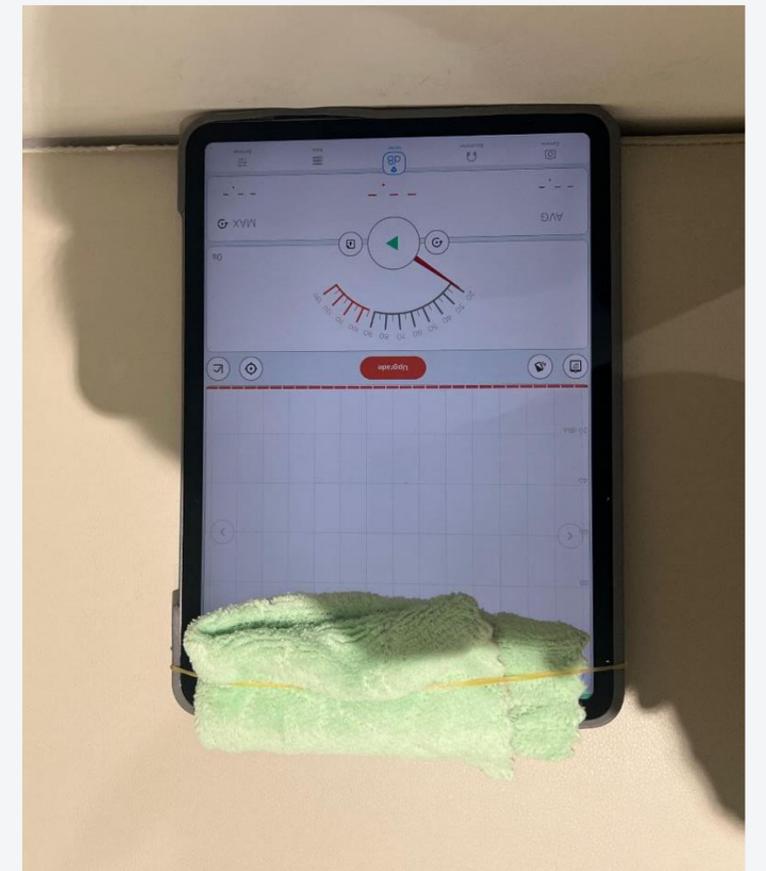
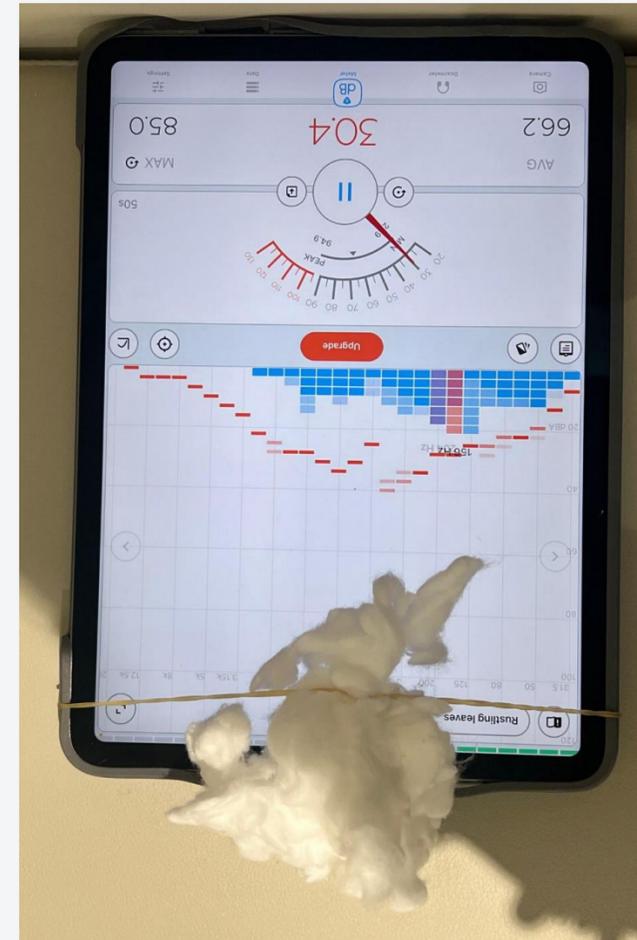
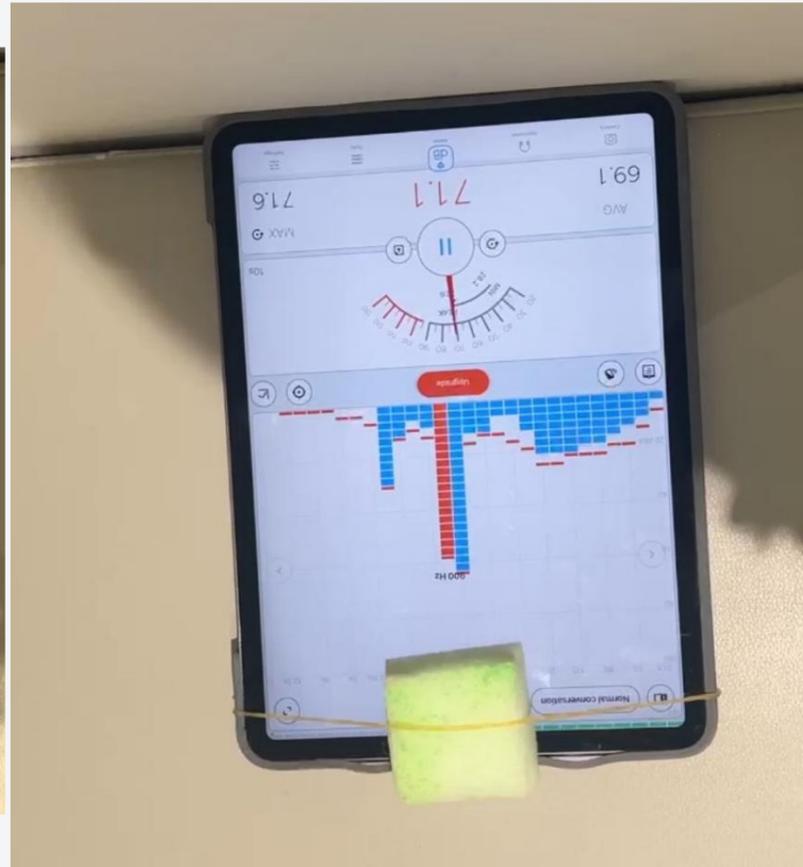
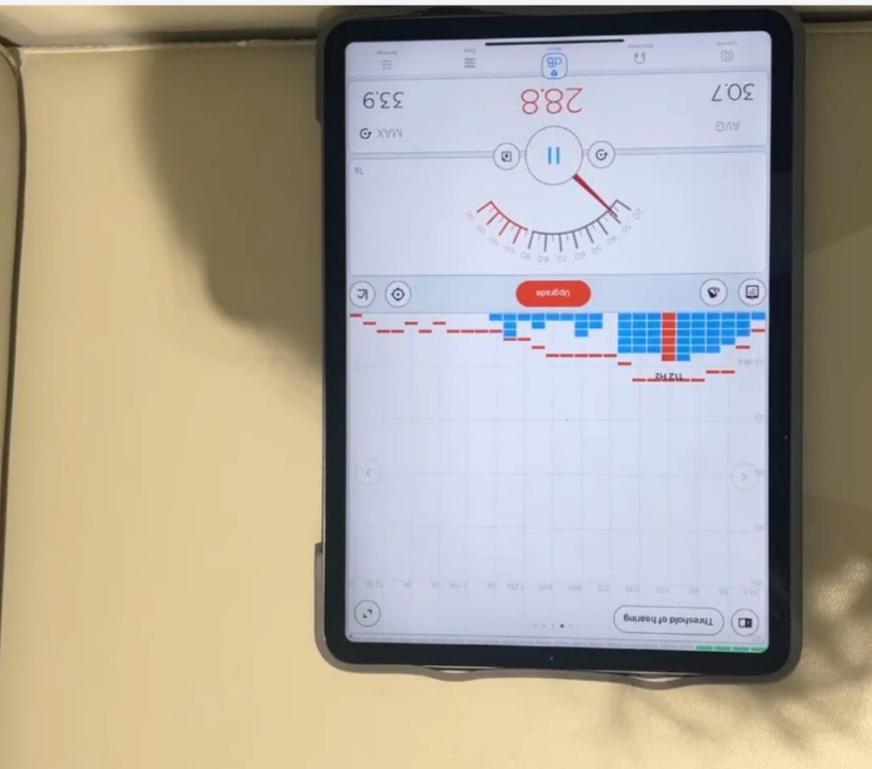
Hz	N/A(dB)
900/	
0	32

	sponge(dB)	towel(dB)	cotton(dB)
Average			
with	79	80	83
without	85	81	85
change	-7%	-1%	-2%

OBJECTIVES OF EXPERIMENT

- To compare the effect of soundproofing of different sound insulation materials (materials only)

EXPERIMENT



RESULT

Hz	N/A(dB)
900	70.9
0	28.8

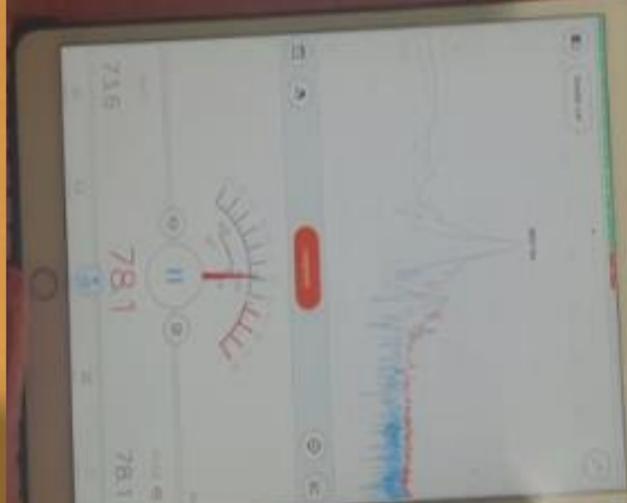
Average

Hz	sponge(dB)	towel(dB)	cotton(dB)
900	71.1	72.2	73
0	29.2	29.5	30.4

OBJECTIVES OF EXPERIMENT

- To compare the effect of soundproofing of different sound insulation materials (box with shock absorbing material)

EXPERIMENT



RESULT

Hz	1 st N/A(dB)	2 nd N/A(dB)	3 rd N/A(dB)
900	78.2	83.9	85.7
0	39	38.4	38.5
1 st	sponge(dB)	towel(dB)	cotton(dB)
with	75.5	78	74.9
change	3.45%	0.26%	4.21%
2 nd	sponge(dB)	towel(dB)	cotton(dB)
with	81.2	81.7	76.5
change	3.21%	2.62%	8.82%
3 rd	sponge(dB)	towel(dB)	cotton(dB)
with	82.1	82.7	76.4
change	4.20%	3.50%	12.10%