



Asian Try Zero-G 2023 Online Guide

ATZ-G 2023 Secretariat

The event schedule of ATZ-G 2023 (tentative)

Time(JST)	Duration	Contents
16:30	30 min	Please access and wait in the Zoom waiting room, and final check will be done after all participants come to the Zoom.
Around 16:45 Start time is subject of change.	150 min	<p>Astronaut Furukawa will perform ATZ-G experiments/exercises on the ISS.</p> <ul style="list-style-type: none"> - Opening remarks by Astronaut Furukawa - Acrylic Stick Experiment (Australia) - Two Ball String Experiment (Thailand) - LATO-LATO Experiments (Indonesia) - Magnetic Field Experiment (Bangladesh) - Magnus Glider Experiments (Taiwan, Singapore) - Break (Area Setup) - Water Sphere Experiment (Thailand) - Oloid Experiment (the Philippines) - Capillary Experiments (Japan) - Zero-G Siphon Experiment (Singapore) - Break (Area Setup) - Blowing Exercise (Taiwan) - Rope Exercise (Japan) - Elastic Band Exercise (the Philippines) - Starfish Exercises (Thailand) - Air Chair Exercise (Japan) - Closing remarks by Astronaut Furukawa

Note

- This guide summarizes how to perform Asian Try Zero-G 2023 experiments/exercises by Astronaut Furukawa on February 13th. Look forward with anticipation to seeing what results you will see.
- Please refrain from distributing this material to anyone other than those involved or uploading it to social media.

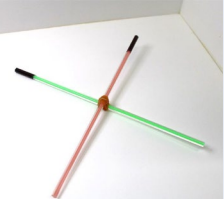
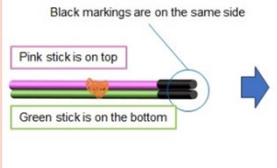
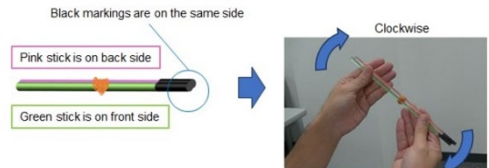
Selected Themes (Experiments/Exercises)

Country/Region	Theme (Experiment)
Australia	Acrylic Stick Experiment
Thailand	Two Ball String Experiment
Indonesia	LATO-LATO Experiments
Bangladesh	Magnetic Field Experiment
Singapore, Taiwan	Magnus Glider Experiments
Thailand	Water Sphere Experiment
Philippines	Oloid Experiment
Japan	Capillary Experiments
Singapore	Zero-G Siphon Experiment

Country/Region	Theme (Exercise)
Taiwan	Blowing Exercise
Japan	Rope Exercise
Philippines	Elastic Band Exercise
Thailand	Starfish Exercise
Japan	Air Chair Exercise

Asian Try-Zero-G 2023 Category A (Simple Physics Experiments)

Experiment 1

Experiment Title (Proposer's Country/Region)	ACRYLIC STICK EXPERIMENT (Australia)					
Description	<p>Goal of this experiment is to show the behavior of Acrylic Stick is taken two forces. One is restoration power of rubber band tied binds sticks together in a cross shape. The other is rotational force by crew.</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="393 422 968 598"> <p>restoration power of rubber band</p> <p>rotational force by crew</p> </div> <div data-bbox="1223 422 1734 598"> <p>restoration power of rubber band</p> <p>rotational force by crew</p> </div> </div> <p>Experiment A: Two forces are orthogonal</p> <p>Experiment B : Two forces are parallel.</p>					
Items/Configuration	 <p style="text-align: center;">Acrylic Stick (1)</p>					
Run# Judge whether it is Joy or No Joy.	1	2	3	4	5	6
Acrylic Stick Experiment A			Joy	Acrylic Stick Experiment B		
<ul style="list-style-type: none"> Black markings are on the same side. Pink stick is on top and green stick is on bottom. Gently release Acrylic Stick in clockwise direction 3 times. 				<ul style="list-style-type: none"> Black markings are on the same side. Pink stick is on back side and green stick is on front side of crew. Gently release Acrylic Stick in clockwise direction 3times. 		
			No Joy	Perform Acrylic Stick Experiment A. (Release 3 times.)		

Asian Try-Zero-G 2023 Category A (Simple Physics Experiments)

Experiment 2

Experiment Title (Proposer's Country/Region) TWO BALL STRING EXPERIMENT (Thailand)

Description Goal of this experiment is to observe the behavior of rotational Two Ball String.

Items/Configuration

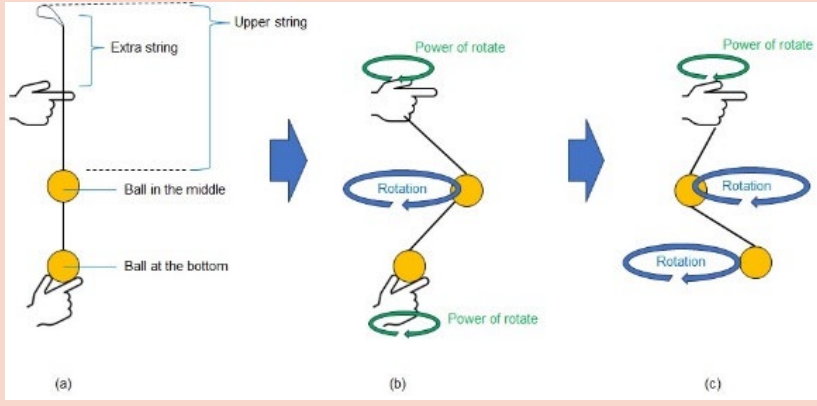


Two Ball String (1)

Run#

1 2 3




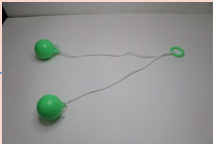



✘ Extending arm helps crew avoid hitting ball to body.



- Hold the middle of the upper string and grab the ball at the bottom. Then rotate Two Ball String 3 times.
- Release the ball at the bottom and keep rotating Two Ball String for about 30 seconds.
- Try 3 times.






Asian Try-Zero-G 2023 Category A (Simple Physics Experiments)

Experiment 3

Experiment Title (Proposer's Country/Region)		LATO-LATO EXPERIMENTS (Indonesia)					
Description	Goal of this experiment is to observe the amplitude of arm swing when performing Rope and Stick Clackers, so-called Lato-Lato.						
Items/Configuration	 Rope Clackers (1)			 Stick Clackers (1)			
Run#	1	2	3	4	5		
Judge whether it is Joy or No Joy.	 <p>Try Rope Clackers in comfortable position.</p>	<p>Joy</p> <ul style="list-style-type: none"> Perform Rope Clackers with elbow flexed. Perform twice, 20 sec. for each. 		 <ul style="list-style-type: none"> Perform Rope Clackers with elbow extended. Perform twice, 20 sec. for each. 			
	<p>No Joy</p>	 <p>Try Stick Clackers in comfortable position.</p>	<p>Joy</p> <ul style="list-style-type: none"> Perform Stick Clackers with elbow flexed. Perform twice, 20 sec. for each. 	 <ul style="list-style-type: none"> Perform Stick Clackers with elbow extended. Perform twice, 20 sec. for each. 	 <ul style="list-style-type: none"> Perform Stick Clackers with elbow extended. Perform twice, 20 sec. for each. 	6	
		<p>No Joy</p>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">quit</div>				

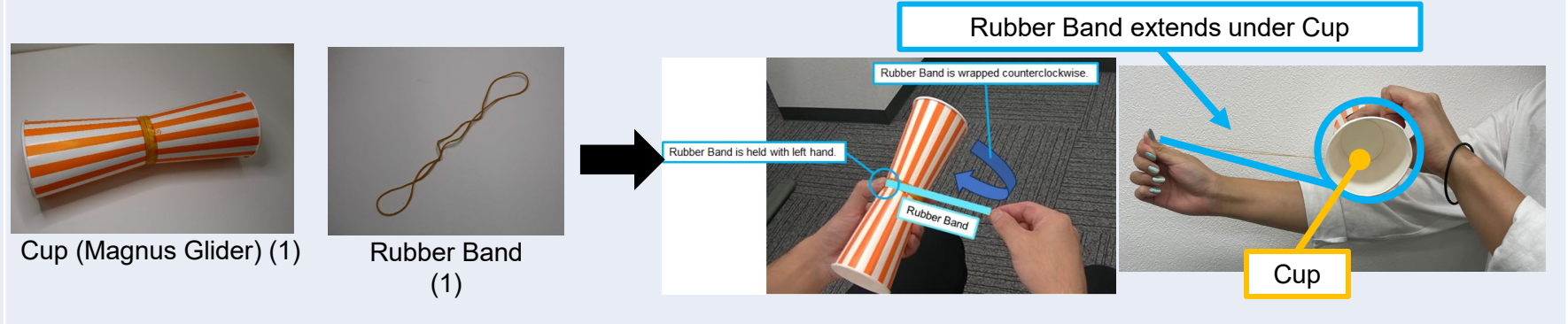



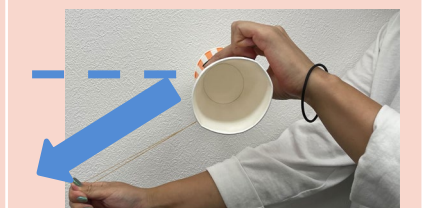
Asian Try-Zero-G 2023 Category A (Simple Physics Experiments)

Experiment 4

Experiment Title (Proposer's Country/Region)	MAGNETIC FIELD EXPERIMENT (Bangladesh)	
Description	Goal of this experiment is to observe the spatial magnetic field.	
Items/Configuration	 <p>Magnetic Field Box (1)</p> <p>Magnetic chips</p>	 <p>Magnet (1)</p>
Run#	1	
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Rotate Magnetic Field Box 360 degrees slowly to show floating magnetic chips.</p> </div> <div style="text-align: center;">  <p>Insert</p> <p>Insert Magnet to Magnetic Field Box.</p> </div> <div style="text-align: center;">  <p>Rotate Magnetic Field Box 360 degrees slowly to show magnetic field lines.</p> </div> </div>	



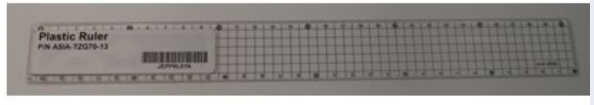
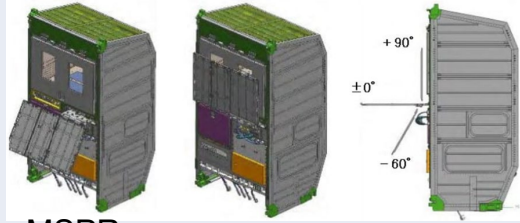
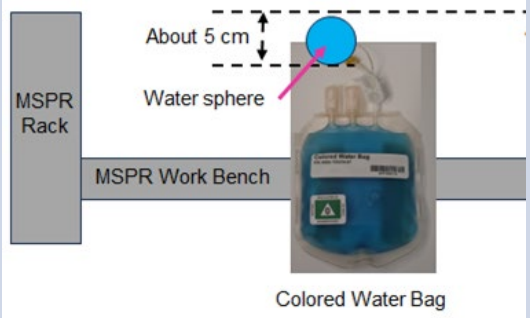
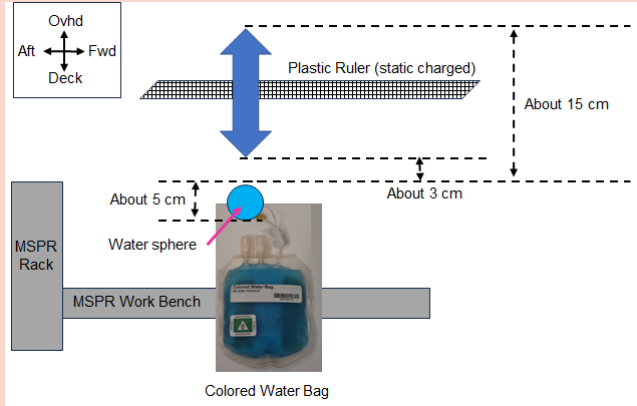
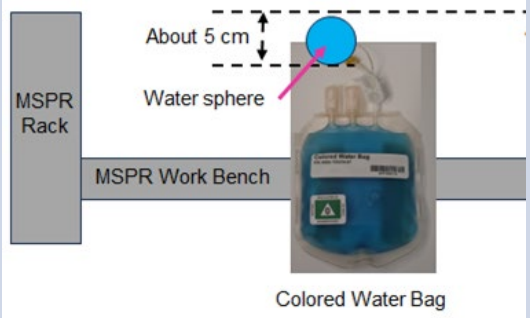
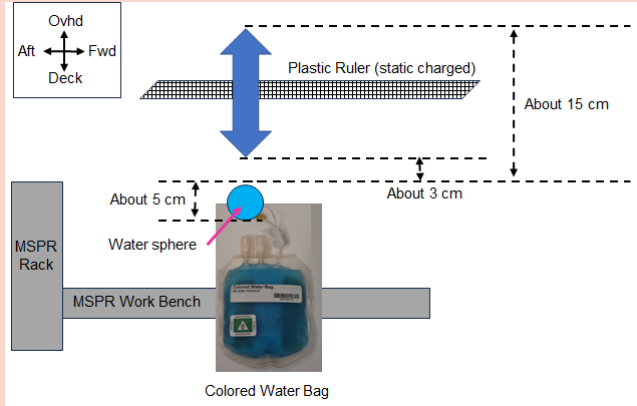
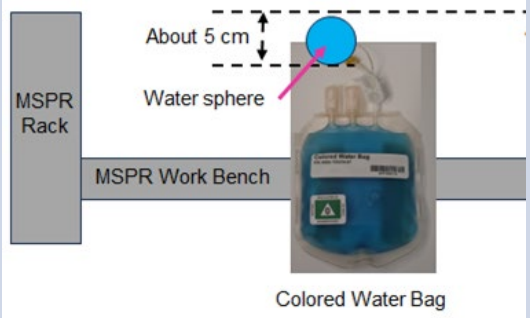
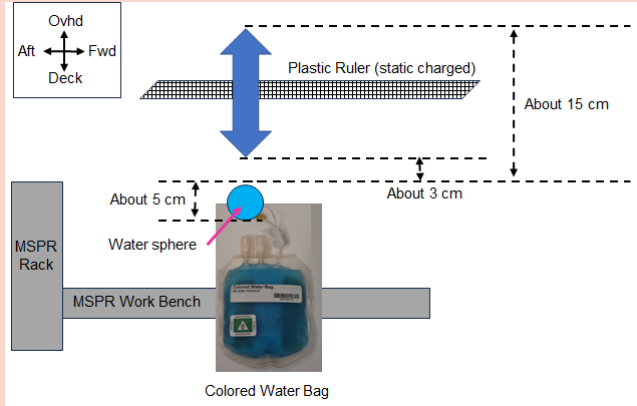
Asian Try-Zero-G 2023 Category A (Simple Physics Experiments)

Experiment 5

Experiment Title (Proposer's Country/Region)	MAGNUS GLIDER EXPERIMENTS (Taiwan, Singapore)			
Description	Goal of this experiment is to observe the trajectory of Magnus Glider in microgravity.			
Items/Configuration				
Run#	<p style="text-align: center;">1</p>  <p>Number of Turns of Rubber Band : 2 Direction : Horizontal</p>	<p style="text-align: center;">2</p>  <p>Number of Turns of Rubber Band : 4 Direction : Horizontal</p>	<p style="text-align: center;">3</p>  <p>Number of Turns of Rubber Band : 2 Direction : Downward</p>	<p style="text-align: center;">4</p>  <p>Number of Turns of Rubber Band : 4 Direction : Downward</p>



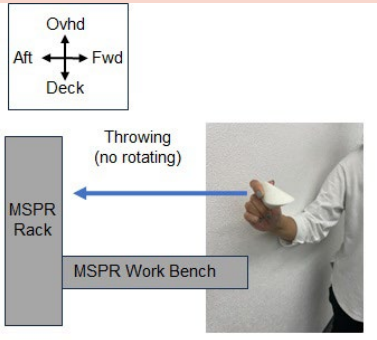
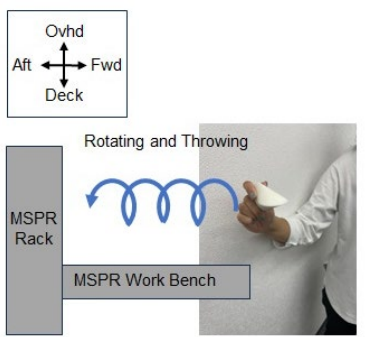
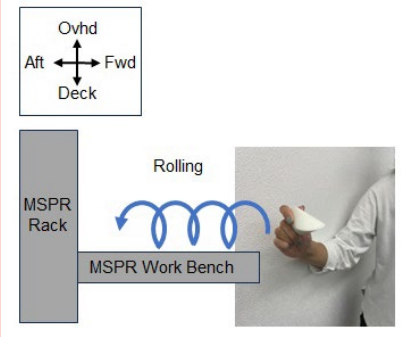
Asian Try-Zero-G 2023 Category A (Simple Physics Experiments)

Experiment 6

Experiment Title (Proposer's Country/Region)	WATER SPHERE EXPERIMENT (Thailand)								
Description	Goal of this experiment is to show water sphere is pulled by Plastic Ruler affected by static electricity.								
Items/Configuration	 Colored Water Bag (1)	 Lint Free Wipes	 Plastic Ruler (1)  MSPR (Multi-purpose Small Payload Rack) Work Bench						
Run#	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;"></th> <th style="width: 33%; text-align: center;">1</th> <th style="width: 33%; text-align: center;">2</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">  <p style="text-align: center;">About 5 cm</p> <p style="text-align: center;">Water sphere</p> <p style="text-align: center;">Colored Water Bag</p> <ul style="list-style-type: none"> • Secure Colored Water Bag on edge of MSPR WB. • Make water sphere about 5 cm. <p>Keep water sphere attached to Colored Water Bag.</p> <ul style="list-style-type: none"> • Put Plastic Ruler between Lint Free Wipes and rub it hard and fast. • Show Lint Free Wipes sticks to Plastic Ruler due to static electricity. </td> <td style="vertical-align: top;">  <p style="text-align: center;">Ovhd Aft ↔ Fwd Deck</p> <p style="text-align: center;">Plastic Ruler (static charged)</p> <p style="text-align: center;">About 15 cm</p> <p style="text-align: center;">About 5 cm</p> <p style="text-align: center;">Water sphere</p> <p style="text-align: center;">About 3 cm</p> <p style="text-align: center;">Colored Water Bag</p> <ul style="list-style-type: none"> • Bring Plastic Ruler close to water sphere within 3cm. • Keep Plastic Ruler for 3 sec. Leave Plastic Ruler for 15cm. • Repeat 3 times. • Do not touch water sphere with Plastic Ruler. If Plastic Ruler were attached water, wipe it with Lint Free Wipes </td> <td style="vertical-align: top;"> <p style="text-align: center;">3</p> </td> </tr> </tbody> </table>				1	2	 <p style="text-align: center;">About 5 cm</p> <p style="text-align: center;">Water sphere</p> <p style="text-align: center;">Colored Water Bag</p> <ul style="list-style-type: none"> • Secure Colored Water Bag on edge of MSPR WB. • Make water sphere about 5 cm. <p>Keep water sphere attached to Colored Water Bag.</p> <ul style="list-style-type: none"> • Put Plastic Ruler between Lint Free Wipes and rub it hard and fast. • Show Lint Free Wipes sticks to Plastic Ruler due to static electricity. 	 <p style="text-align: center;">Ovhd Aft ↔ Fwd Deck</p> <p style="text-align: center;">Plastic Ruler (static charged)</p> <p style="text-align: center;">About 15 cm</p> <p style="text-align: center;">About 5 cm</p> <p style="text-align: center;">Water sphere</p> <p style="text-align: center;">About 3 cm</p> <p style="text-align: center;">Colored Water Bag</p> <ul style="list-style-type: none"> • Bring Plastic Ruler close to water sphere within 3cm. • Keep Plastic Ruler for 3 sec. Leave Plastic Ruler for 15cm. • Repeat 3 times. • Do not touch water sphere with Plastic Ruler. If Plastic Ruler were attached water, wipe it with Lint Free Wipes 	<p style="text-align: center;">3</p>
	1	2							
 <p style="text-align: center;">About 5 cm</p> <p style="text-align: center;">Water sphere</p> <p style="text-align: center;">Colored Water Bag</p> <ul style="list-style-type: none"> • Secure Colored Water Bag on edge of MSPR WB. • Make water sphere about 5 cm. <p>Keep water sphere attached to Colored Water Bag.</p> <ul style="list-style-type: none"> • Put Plastic Ruler between Lint Free Wipes and rub it hard and fast. • Show Lint Free Wipes sticks to Plastic Ruler due to static electricity. 	 <p style="text-align: center;">Ovhd Aft ↔ Fwd Deck</p> <p style="text-align: center;">Plastic Ruler (static charged)</p> <p style="text-align: center;">About 15 cm</p> <p style="text-align: center;">About 5 cm</p> <p style="text-align: center;">Water sphere</p> <p style="text-align: center;">About 3 cm</p> <p style="text-align: center;">Colored Water Bag</p> <ul style="list-style-type: none"> • Bring Plastic Ruler close to water sphere within 3cm. • Keep Plastic Ruler for 3 sec. Leave Plastic Ruler for 15cm. • Repeat 3 times. • Do not touch water sphere with Plastic Ruler. If Plastic Ruler were attached water, wipe it with Lint Free Wipes 	<p style="text-align: center;">3</p>							

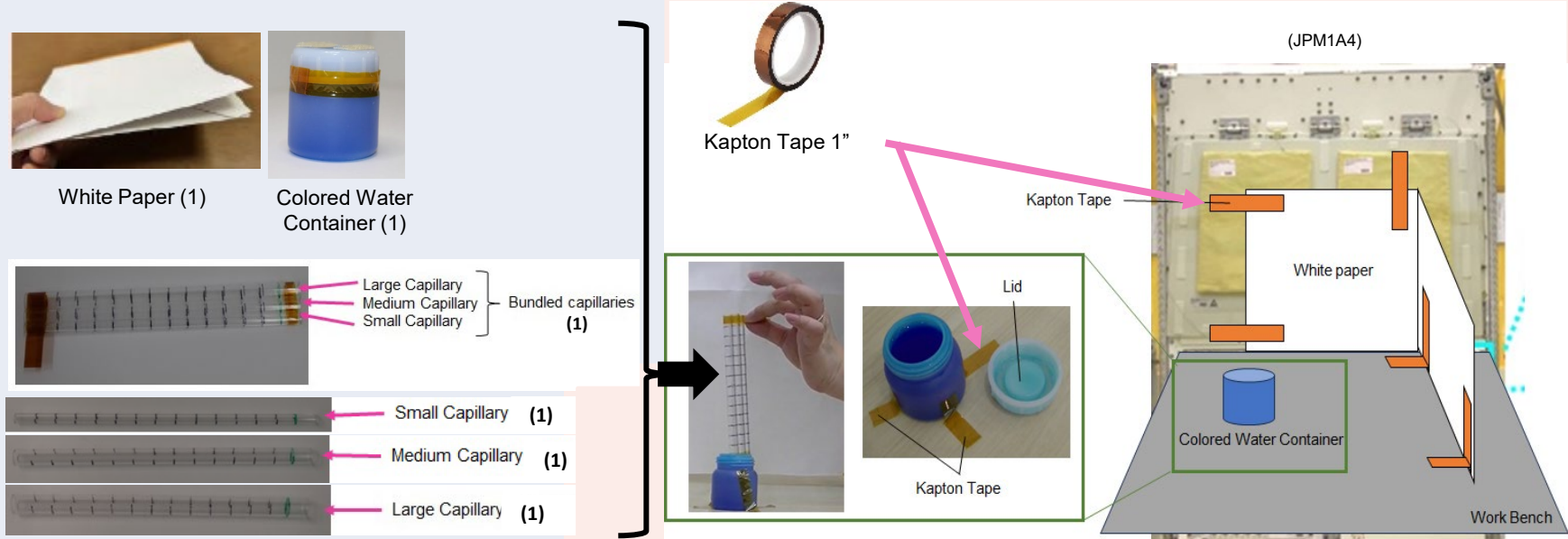
Asian Try-Zero-G 2023 Category A (Simple Physics Experiments)

Experiment 7

Experiment Title(Proposer's Country/Region)		OLOID EXPERIMENT (the Philippines)									
Description	Goal of this experiment is to show the behavior of Oloid rolling in microgravity.										
Items/Configuration	 <p>Oloid</p>			 <p>Video of Oloid rolling</p>							
Run#	1	2	3	4	5	6	7	8	9		
											
	<ul style="list-style-type: none"> • Gently throw Oloid without rotation above MSPR WB. • Catch Oloid before it hits MSPR Rack. • Try 3 times. 			<ul style="list-style-type: none"> • Gently throw Oloid with rotation above MSPR WB. • Catch Oloid before it hits MSPR Rack. • Try 3 times. 			<ul style="list-style-type: none"> • Gently roll Oloid on MSPR WB. • Catch Oloid before it hits MSPR Rack. • Try 3 times. 				

Asian Try-Zero-G 2023 Category A (Simple Physics Experiments)

Experiment 8

Experiment Title (Proposer's Country/Region)	CAPILLARY EXPERIMENTS (Japan)			
Description	Goal of this experiment is to show the difference in the speed at water level rises depending on the thickness of pipes.			
Items/Configuration	 <p>White Paper (1) Colored Water Container (1)</p> <p>Large Capillary Medium Capillary Small Capillary } Bundled capillaries (1)</p> <p>Small Capillary (1) Medium Capillary (1) Large Capillary (1)</p> <p>Kapton Tape 1"</p> <p>Kapton Tape</p> <p>White paper</p> <p>Colored Water Container</p> <p>Work Bench</p> <p>(JPM1A4)</p> <p>Lid</p> <p>※Match green marks with the colored water surface when inserting the capillaries.</p>			
Run#	1	2	3	4
※SSIPC Judge whether it is Joy or No Joy.	Insert Bundled Capillaries Joy → quit No Joy →	Insert Small Capillary (the thinnest).	Insert Medium Capillary (middle thickness).	Insert Large Capillary (the thickest).

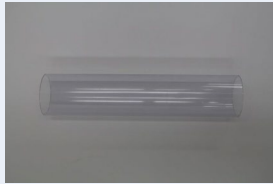

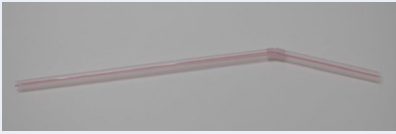
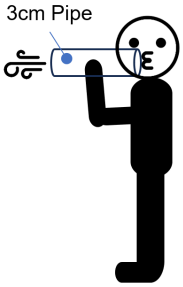
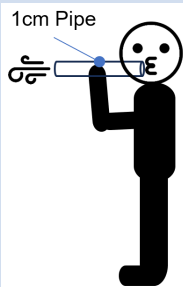
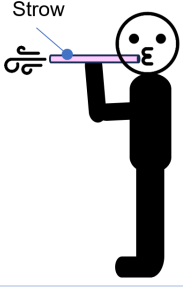


Asian Try-Zero-G 2023 Category A (Simple Physics Experiments)

Experiment 9

Experiment Title (Proposer's Country/Region)	Zero-G Siphon Experiment (Singapore)		
Description	Goal of this experiment is to observe water continues to move like a siphon.		
Items/Configuration	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Straw (1) (S/N 001) Straw (1) (S/N 002)</p> </div> <div style="border: 2px solid green; padding: 5px;"> <p>Strow (S/N 002)</p> <p>Strow (S/N 001)</p> <p>Water level rises</p> <p>Green marking can be ignored.</p> <p>There is space between the Strow (S/N 001) and the bottom of Colored Water Container.</p> <p>Colored Water Container</p> </div> <div style="text-align: center;"> <p>Kapton Tape 1"</p> <p>White paper</p> <p>Colored Water Container</p> <p>Work Bench</p> </div> </div> <div style="margin-top: 10px; text-align: center;"> <p>Keep the edge of Straw (S/N 001) away from the bottom of Colored Water Container.</p> <p>Attach Kapton Tape on top of Colored Water Container to prevent water from overflowing.</p> </div>		
Run#	<p style="text-align: center;">1</p> <div style="text-align: center;"> <p>Strow (S/N 002)</p> <p>Strow (S/N 001)</p> </div> <p>Blow with Straw (S/N 002) vertical to Straw (S/N 001).</p>	<p style="text-align: center;">2</p> <div style="text-align: center;"> <p>Strow (S/N 002)</p> <p>Strow (S/N 001)</p> </div> <p>Try blowing with an arbitrary angle in case colored water does not rise inside Straw (S/N 001).</p>	<p style="text-align: center;">3</p> <div style="text-align: center;"> <p>Strow (S/N 002)</p> <p>Strow (S/N 001)</p> </div> <p>Try another angle.</p>

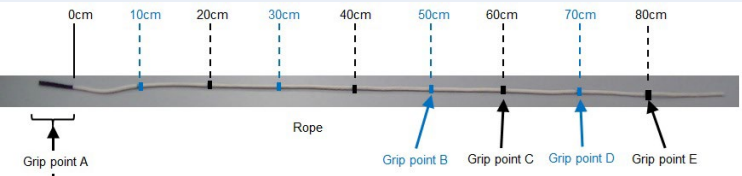






Asian Try-Zero-G 2023 Category B (Exercises)

Exercise 1

Exercise Title(Proposer's Country/Region)		BLOWING EXERCISE (Taiwan)				
Description	Goal of this experiment is to show the difference in ease of body movement depending on posture and the thickness of pipes.					
Items/Configuration	 3cm Pipe (1)	 1cm Pipe (1)	 Straw (S/N 003) (1)			
Run#	<p style="text-align: center;">1</p>  <p style="text-align: center;">3cm Pipe</p>	<p style="text-align: center;">2</p>  <p style="text-align: center;">1cm Pipe</p>	<p style="text-align: center;">3</p>  <p style="text-align: center;">Straw</p>	<p style="text-align: center;">4</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> If SSIPC required, perform these runs. </div>  <p style="text-align: center;">in a kneeling position</p>		<p style="text-align: center;">5</p>  <p style="text-align: center;">in a cross-legged position</p>
	<p style="text-align: center;">in natural posture</p> <ul style="list-style-type: none"> • Hold 3cm Pipe, 1cm Pipe or Straw (S/N 003) in mouth. • Blow for 20 sec. in natural posture. 			<ul style="list-style-type: none"> • Hold the designated pipe or straw in mouth. • Blow for 20 sec. in a kneeling position. 	<ul style="list-style-type: none"> • Hold the designated pipe or straw in mouth. • Blow for 20 sec. in a cross-legged position. 	


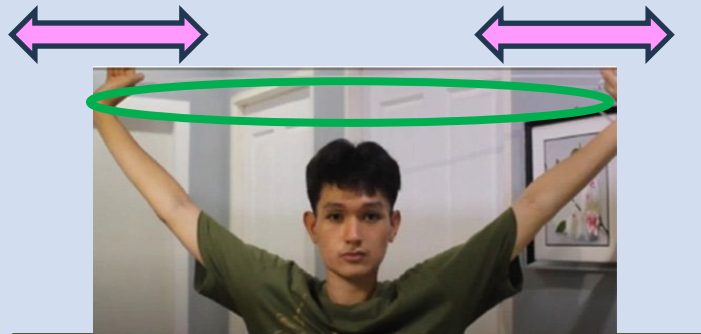

Asian Try-Zero-G 2023 Category B (Exercises)

Exercise 2

Exercise Title(Proposer's Country/Region)	ROPE EXERCISE (Japan)														
Description	Goal of this experiment is to show the difference in ease of this exercise depending on gravity, and to check the ease of movement of joints during long space stay.														
Items/Configuration	 <p>Rope (1)</p> <p>※Only the markings are provided with the interval of 10 cm.</p>														
Run#	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center; vertical-align: top;">  <p>Grip "Grip point A" and the designated grip point.</p> </td> <td style="width: 33%; text-align: center; vertical-align: top;">  <p>Pass body through Rope :</p> <p>Under the legs ↓ Back ↓ Above head ↓ Front of body</p> </td> <td style="width: 34%; text-align: center; vertical-align: top;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center; vertical-align: top;"> 1 <ul style="list-style-type: none"> Try with Grip points A and E (80cm) </td> <td style="width: 33%; text-align: center; vertical-align: top;"> 2 <ul style="list-style-type: none"> Try with Grip points A and C (60cm) </td> <td style="width: 34%; text-align: center; vertical-align: top;"> 3 <ul style="list-style-type: none"> Try with Grip points A and D (70cm) <p>If Run#2 is hard, try this option.</p> </td> </tr> <tr> <td colspan="2" style="text-align: center; vertical-align: middle;"> Hard </td> <td style="text-align: center; vertical-align: middle;"> Easy </td> </tr> <tr> <td colspan="2"></td> <td style="text-align: center; vertical-align: top;"> <ul style="list-style-type: none"> Try with Grip points A and B (50cm) <p>If Run#2 is easy, try this option.</p> </td> </tr> </table> </td> </tr> </table>			 <p>Grip "Grip point A" and the designated grip point.</p>	 <p>Pass body through Rope :</p> <p>Under the legs ↓ Back ↓ Above head ↓ Front of body</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center; vertical-align: top;"> 1 <ul style="list-style-type: none"> Try with Grip points A and E (80cm) </td> <td style="width: 33%; text-align: center; vertical-align: top;"> 2 <ul style="list-style-type: none"> Try with Grip points A and C (60cm) </td> <td style="width: 34%; text-align: center; vertical-align: top;"> 3 <ul style="list-style-type: none"> Try with Grip points A and D (70cm) <p>If Run#2 is hard, try this option.</p> </td> </tr> <tr> <td colspan="2" style="text-align: center; vertical-align: middle;"> Hard </td> <td style="text-align: center; vertical-align: middle;"> Easy </td> </tr> <tr> <td colspan="2"></td> <td style="text-align: center; vertical-align: top;"> <ul style="list-style-type: none"> Try with Grip points A and B (50cm) <p>If Run#2 is easy, try this option.</p> </td> </tr> </table>	1 <ul style="list-style-type: none"> Try with Grip points A and E (80cm) 	2 <ul style="list-style-type: none"> Try with Grip points A and C (60cm) 	3 <ul style="list-style-type: none"> Try with Grip points A and D (70cm) <p>If Run#2 is hard, try this option.</p>	Hard		Easy			<ul style="list-style-type: none"> Try with Grip points A and B (50cm) <p>If Run#2 is easy, try this option.</p>
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Hard		Easy													
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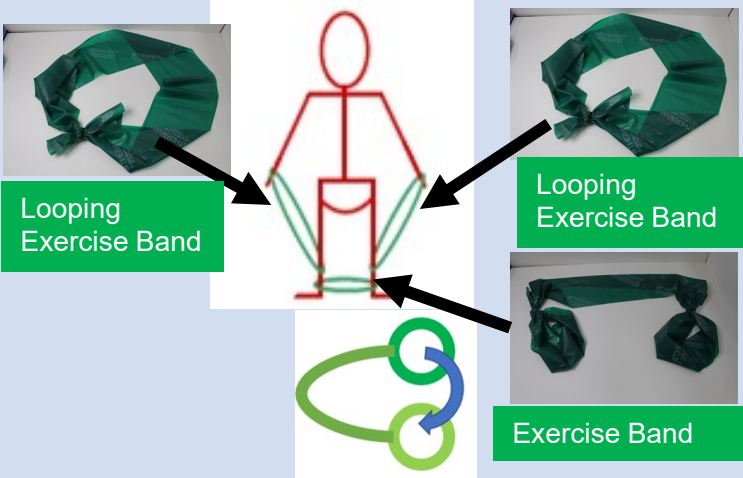
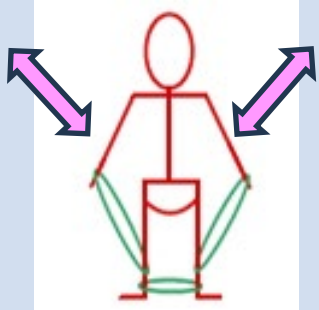

Asian Try-Zero-G 2023 Category B (Exercises)

Exercise 3

Exercise Title(Proposer's Country/Region)				ELASTIC BAND EXERCISE (the Philippines)											
Description								Goal of this experiment is to show effects of these exercises for crew in microgravity.							
Items/Configuration				Looping Exercise Band (1)											
Run#	1	2	3	4	5	6	7	8							
Elastic Band Exercise A				Elastic Band Exercise B											
															
Fix both feet to Handrail				Fix both feet to Handrail											
<ul style="list-style-type: none"> Put Looping Exercise Band on wrist. Open and close both arms slowly 4 times. 				<ul style="list-style-type: none"> Fold Looping Exercise Band in double and put it on thighs. Squat with hands in front 4 times. 											


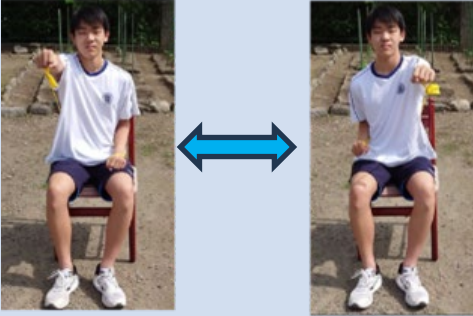
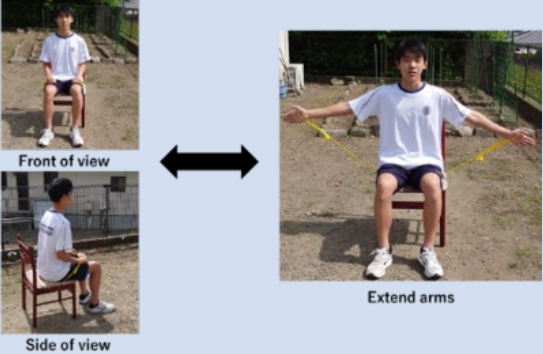


Asian Try-Zero-G 2023 Category B (Exercises)

Exercise 4

Exercise Title (Proposer's Country/Region)		STARFISH EXERCISES (Thailand)														
Description		Goal of this experiment is to show effects of Starfish exercises for crew in microgravity.														
Items/Configuration		 <p>Looping Exercise Band (2)</p>					 <p>Exercise Band (1)</p>									
Run#		 <p>Looping Exercise Band</p> <p>Exercise Band</p> <ul style="list-style-type: none"> Put feet through Exercise Band. Put foot and grip each Looping Exercise Band. 					<p>1 2 3 4 5</p> <p>Starfish Exercise A</p>  <p>Fix both feet to Handrail</p> <ul style="list-style-type: none"> Raise and lower both arms at the same time 5 times. 					<p>6 7 8 9 10</p> <p>Starfish Exercise B</p>  <p>○ : Fix one hand and foot to Handrail</p> <ul style="list-style-type: none"> Raise and lower the other leg and hand 5 times at the same times. 				

Asian Try-Zero-G 2023 Category B (Exercises)

Exercise 5

Exercise Title(Proposer's Country/Region)					AIR CHAIR EXERCISE (Japan)																														
Description												Goal of this experiment is to show effects of Air Chair exercises for crew in microgravity.																							
Items/Configuration												 <p>Exercise Band (1)</p>																							
Run#												1	2	3	4	5	6	7	8	9	10	11	12												
Air Chair Exercise A												Air Chair Exercise B												If SSIPC required, perform these runs.											
																																			
<div style="background-color: #6aa84f; color: white; padding: 5px; text-align: center;">Fix both feet to Handrail</div>												<div style="background-color: #6aa84f; color: white; padding: 5px; text-align: center;">  : Fix on Handrail </div>																							
<ul style="list-style-type: none"> • Exercise Band is on waist. • Bend knees and lower hips. • Put hands forward alternately 4 times. 												<ul style="list-style-type: none"> • Exercise Band is on buttocks. • Bend knees and lower hips. • Raise and lower arms 4 times at the same time. 												<ul style="list-style-type: none"> • Exercise Band is on ankles. • Bend knees and lower hips. • Open and close legs alternately 4 times. • Fix each foot on Handrail alternately. 											