



## **Mission 14 Logbook Final Spacecraft and Lander Design**

**SETI INSTITUTE Exobiology Instruments and a Final Analysis**

### **The Final Worksheet**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Title of spacecraft or lander instrument:

1. Purpose of the instrument:

2. Major steps in the instrument's experiment or test:

3. Expected results:

Positive Indicator:

Negative Indicator:

4. What would these results indicate about the presence of life at the landing site?



# Final Spacecraft and Lander Design Exobiology Instruments and a Final Analysis

## SETI INSTITUTE A summary of Life Detection Tests

**Table 14.3.**

<b>Test</b>	<b>Test Question</b>	<b>Mission</b>
Still camera photographs	Organism-like objects	No such objects
Video camera to look for movement	Movements of organism-like objects	No such movement
Microscopic camera	Organism-like objects	
Plate soil on nutrient gelatin	Growth in Petri dish	No growth
Identify water by its freezing point	Liquid water on site	No liquid water
Identify water by its boiling point	Liquid water on site	No liquid water
Expose soil to water	Growth or movement of organism-like objects	No such growth or movement
Burn or char a substance	Blackening	No blackening
Iodine test for starch	Blue color	No color change
Ninhydrin test for protein	Blue color	No color change
Expose Life Traps to air	Growth in Life Trap	No growth
Analyze gas production of soil	Release of gas	No release of gas



## Final Spacecraft and Lander Design Exobiology Instruments and a Final Analysis

### SETI INSTITUTE Instruments Results—Data Printouts

Attention Earth!

Incoming Data from the Mission to Mars

Landing Site # 1-Mars, Utopia Planitia Desert

**Table 14.4**

Test	Result
Still camera photographs	Inconclusive
Video camera to look for movement	Negative
Microscopic camera	Negative
Plate soil on nutrient gelatin	Negative
Identify water by its freezing point	Negative
Identify water by its boiling point	Negative
Expose soil to water	Motion
Burn or char a substance	Negative
Iodine test for starch	Negative
Ninhydrin test for protein	Negative
Expose Life Traps to air	Negative
Analyze gas production of soil	Quick release of gas
Other:	

Attention Earth!

Incoming Data from the Mission to Mars

Landing Site # 2-Mars, Olympus Mons Volcano

**Table 14.5.**

Test	Result
Still camera photographs	Inconclusive
Video camera to look for movement	Negative
Microscopic camera	Inconclusive
Plate soil on nutrient gelatin	Positive
Identify water by its freezing point	Positive
Identify water by its boiling point	Positive
Expose soil to water	Motion
Burn or char a substance	Negative
Iodine test for starch	Negative
Ninhydrin test for protein	Negative
Expose Life Traps to air	Positive
Analyze gas production of soil	Slow release of gas
Other:	

Attention Earth!  
Incoming Data from the Mission to Mars  
Landing Site # 3-Mars, North Pole

**Table 14.6**

<b>Test</b>	<b>Result</b>
Still camera photographs	Negative
Video camera to look for movement	Negative
Microscopic camera	Inconclusive
Plate soil on nutrient gelatin	Negative
Identify water by its freezing point	Positive
Identify water by its boiling point	Positive
Expose soil to water	Negative
Burn or char a substance	Negative
Iodine test for starch	Negative
Ninhydrin test for protein	Negative
Expose Life Traps to air	Positive
Analyze gas production of soil	Quick release of gas
Other:	

Attention Earth!  
Incoming Data from the Mission to Mars  
Landing Site # 3-Mars, North Pole

**Table 14.7**

<b>Test</b>	<b>Result</b>
Still camera photographs	Inconclusive
Video camera to look for movement	Negative
Microscopic camera	Inconclusive
Plate soil on nutrient gelatin	Negative
Identify water by its freezing point	Positive
Identify water by its boiling point	Positive
Expose soil to water	Motion
Burn or char a substance	Negative
Iodine test for starch	Negative
Ninhydrin test for protein	Negative
Expose Life Traps to air	Positive
Analyze gas production of soil	Quick release of gas
Other:	

Attention Earth!

Incoming Data from the Mission to Venus

Landing Site # 4-Venus, Aphrodite Terra Continental Plate

**Table 14.8**

<b>Test</b>	<b>Result</b>
Still camera photographs	Inconclusive
Video camera to look for movement	Positive
Microscopic camera	Inconclusive
Plate soil on nutrient gelatin	Positive
Identify water by its freezing point	Positive
Identify water by its boiling point	Positive
Burn or char a substance	Positive
Iodine test for starch	Positive
Ninhydrin test for protein	Positive
Expose Life Traps to air	Positive
Analyze gas production of soil	N/A This is a test on atmosphere
Other:	

Attention Earth!

Incoming Data From the Mission to Venus

Landing Site # 6-Venus, Rhea Mons Volcano

<b>Test</b>	<b>Result</b>
Still camera photographs	Inconclusive
Video camera to look for movement	Negative
Microscopic camera	Inconclusive
Plate soil on nutrient gelatin	Negative
Identify water by its freezing point	Positive
Identify water by its boiling point	Positive
Expose soil to water	Negative
Burn or char a substance	Negative
Iodine test for starch	Negative
Ninhydrin test for protein	Negative
Expose Life Traps to air	Positive
Analyze gas production of soil	Quick release of gas
Other:	

Attention Earth!  
Incoming Data From the Mission to Mars  
Landing Site

**Table 14.10**

<b>Test</b>	<b>Result</b>
Still camera photographs	
Video camera to look for movement	
Microscopic camera	
Plate soil on nutrient gelatin	
Identify water by its freezing point	
Identify water by its boiling point	
Expose soil to water	
Burn or char a substance	
Iodine test for starch	
Ninhydrin test for protein	
Expose Life Traps to air	
Analyze gas production of soil	
Other:	

Attention Earth!  
Incoming Data From the Mission to the Surface of Venus  
Landing Site

**Table 14.11**

<b>Test</b>	<b>Result</b>
Still camera photographs	
Video camera to look for movement	
Microscopic camera	
Plate soil on nutrient gelatin	
Identify water by its freezing point	
Identify water by its boiling point	
Expose soil to water	
Burn or char a substance	
Iodine test for starch	
Ninhydrin test for protein	
Expose Life Traps to air	
Analyze gas production of soil	
Other:	



# Final Spacecraft and Lander Design Exobiology Instruments and a Final Analysis Interpretation of Data - Worksheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Landing Site:

Test # 1:

Result:

Conclusion:

Test # 2:

Result:

Conclusion:

Test # 3:

Result:

Conclusion:

Is there life at your test site? Explain why or why not.



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**Final Spacecraft and Lander Design  
Exobiology Instruments and a Final Analysis  
Summit Notes—Worksheet**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Landing site # 1:

Is there life there? Why or why not?

2. Landing site # 2:

Is there life there? Why or why not?

3. Landing site # 3:

Is there life there? Why or why not?

4. Landing site # 4:

Is there life there? Why or why not?

5. Landing site # 5:

Is there life there? Why or why not?

6. Landing site # 6:

Is there life there? Why or why not?