

MWSS111 CADET ACADEMY

CADET MISSION 003

The Neon Flying Squid Observation Mission

A Science Storybook + Mission Workbook

LRS VANGUARD-6

MILKY WAY SPACE STATION 111

LONG RANGE SCIENTIFIC EXPLORATION VESSEL

VANGUARD-6 • SPECIFICATIONS

LENGTH:	240 m
BEAM:	62 m
HEIGHT:	48 m
MASS:	85,600 t
CREW:	58
SCIENCE CREW:	24
MAX VELOCITY:	0.78 c
RANGE:	UNLIMITED
PROPULSION:	TRI-FUSION DRIVE
POWER PLANT:	QUANTUM INERTIAL CONFINEMENT
CAPACITY:	2 GMTO PROBES (STANDARD)
	4 GMTO PROBES (MAX)
	MULTIPLE CARGO MODULES
	SCIENCE LABS
	LONG DURATION HABITAT

GMTO SUBMERSIBLE OBSERVATION PROBE

AUTONOMOUS SCIENTIFIC VEHICLE

- 1.20 m DIAMETER
- PRESSURE RATED SPHERE
- GMTO MULTIDIMENSIONAL SENSOR CORE
- OPTICAL / LOW-LIGHT CAMERAS
- SONAR & PASSIVE ACOUSTIC ARRAY
- OCEANOGRAPHIC SENSOR SUITE
- EXTREMELY QUIET PROPULSION
- AUTONOMOUS NAVIGATION
- REAL-TIME DATA LINK TO VANGUARD-6

CARGO BAY – PROBE DEPLOYMENT



PROBE SCALE COMPARISON



PROBE – EXTERIOR VIEWS



FRONT VIEW



REAR VIEW

PROBE – DEPLOYMENT SEQUENCE



1



2



3



4



4

PROBE – UNDERWATER OPERATION



GMTO – GALACTIC MULTIDIMENSIONAL TOPOLOGY OBSERVER • SCIENTIFIC EXPLORATION • NON-INVASIVE • PASSIVE OBSERVATION • PRESERVING ALL LIFE

Mission: Travel from orbit to the Pacific east of Japan, observe neon flying squid above the sea, and deploy a small GMTO submersible probe to continue the study underwater.

CADET NAME: _____ DATE: _____

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1. From Orbit to Earth



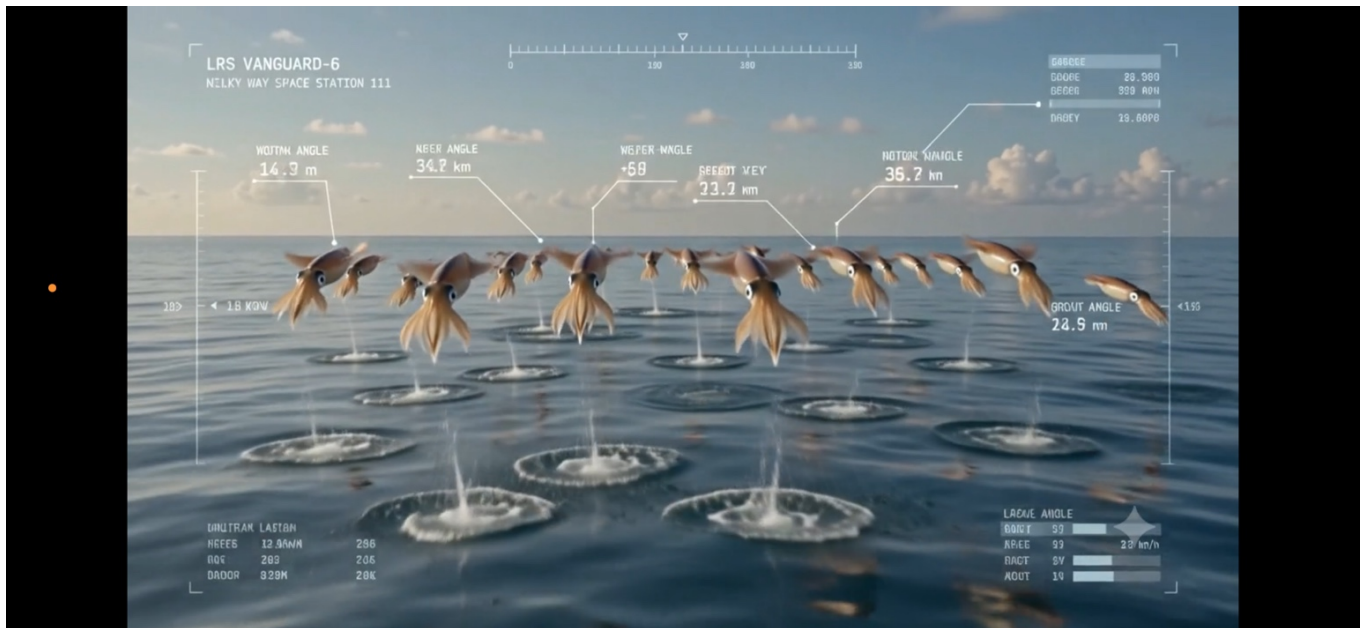
Vanguard-6 leaves orbital altitude and begins a controlled descent toward Earth. The crew targets an observation zone over the Pacific Ocean east of Japan, where neon flying squid have been reported.

Flight Officer: "Atmospheric interface confirmed. Pacific observation zone ahead."

Science Officer: "GMTO sensors are active. We will begin with passive observation."

Cadet science note: A spacecraft moving from space into the atmosphere encounters rapidly increasing air density. The crew must control heating, speed, and flight path.

2. First Surface Contact



At the observation zone, the ocean suddenly becomes active. Squid accelerate upward, break through the surface, and travel through the air for a short distance before returning to the sea.

Cadet Observer: "Multiple animals airborne! They are leaving separate splash points."

Science Officer: "Record emergence spacing, airborne time, direction, and re-entry position."

Science note: Neon flying squid do not fly like birds. Their aerial movement is a brief jet-assisted glide. The mission imagery is a dramatic reconstruction for the Cadet Academy.

3. Vanguard-6 Holds Position



Vanguard-6 hovers at a respectful distance while the squid continue their surface activity. The crew does not chase them. Instead, cameras and the GMTO record the event from above.

Mission Commander: "Maintain distance. We are observers, not participants."

GMTO Science Station: "Tracking the group. Comparing launch direction with surface current and wind."

Cadet question: If the squid repeatedly travel in one direction, what measurements would help determine whether they are responding to prey, current, wind, or another environmental condition?

4. The Scientists Compare the Data



On the bridge, the science team compares the animals' movement with maps, sensor readings, and the location of each emergence and re-entry point. A single spectacular observation is not enough; the team looks for a repeatable pattern.

Science Officer: "Do not assume formation flight. Measure it."

Cadet Observer: "If their spacing repeats, we can compare it with the current and the location of the school below."

Scientific discipline: Separate **observation** from **interpretation**. First record what happened. Then propose explanations that can be tested.

5. Arrival Above the Pacific



With the surface event documented, the bridge establishes a stable observation pattern. The GMTO continues to monitor the sea while the team prepares for the underwater phase.

The mission rule remains simple: **observe without interfering.**

6. A Giant Ship, a Tiny Target



Vanguard-6 is a long-range exploration vessel with laboratories, living quarters, cargo modules, and scientific equipment. It is far too large to follow small squid closely underwater without risking disturbance.

The crew therefore selects an instrument that matches the scale of the subject: the compact GMTO submersible observation probe.

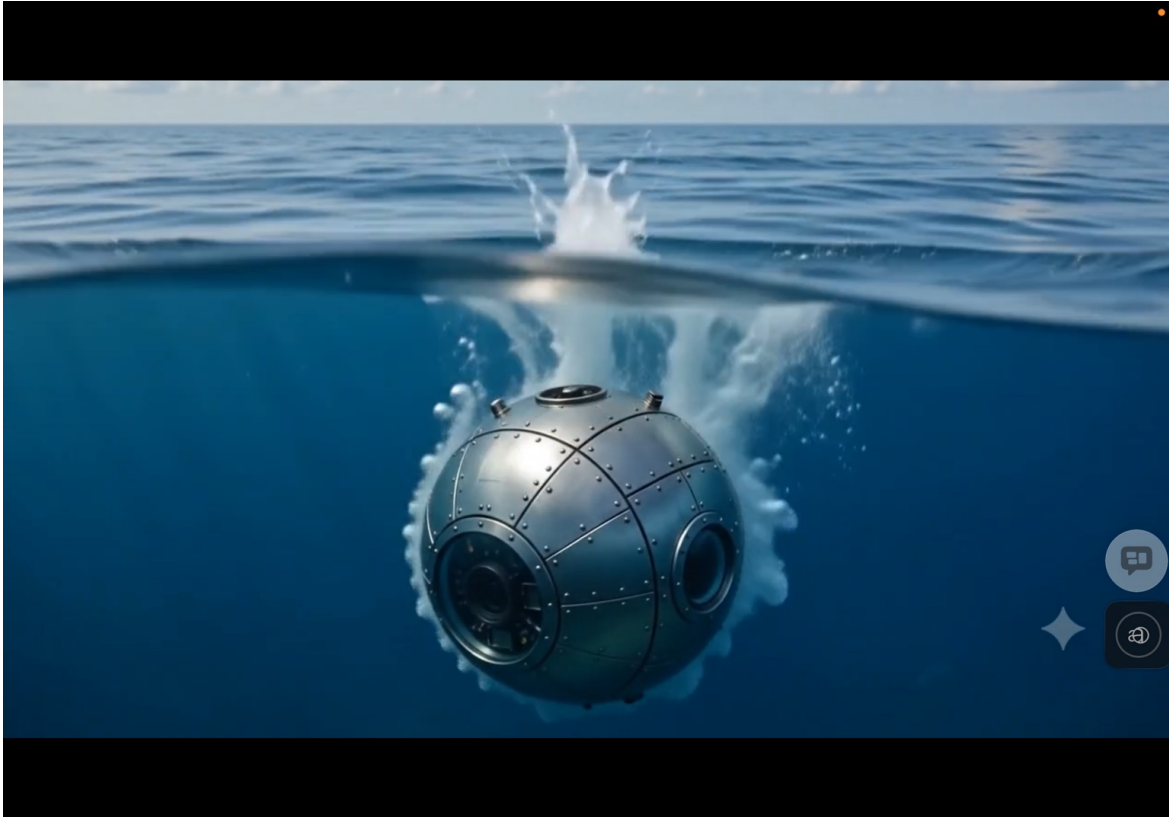
7. Deploy the GMTO Probe



The cargo bay opens and the compact spherical probe is lowered toward the water. It carries cameras, passive acoustic sensors, oceanographic instruments, and a data link back to Vanguard-6.

The probe is designed for **non-invasive observation**. It will not catch, touch, feed, or deliberately chase the squid.

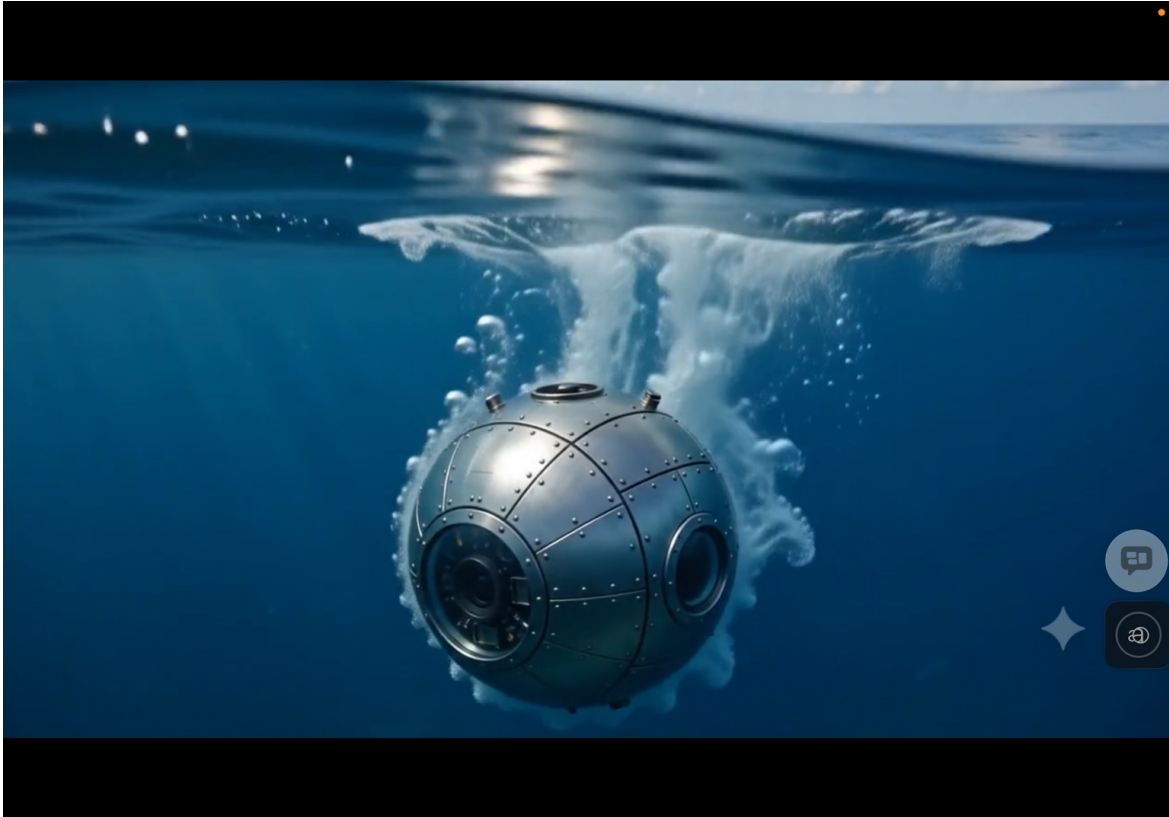
8. Crossing the Ocean Surface



The probe enters the Pacific and begins its descent. Above it, Vanguard-6 remains on station. Below it stretches the enormous three-dimensional habitat of the open-ocean water column.

Temperature, currents, light, predators, and prey can all influence where pelagic squid travel.

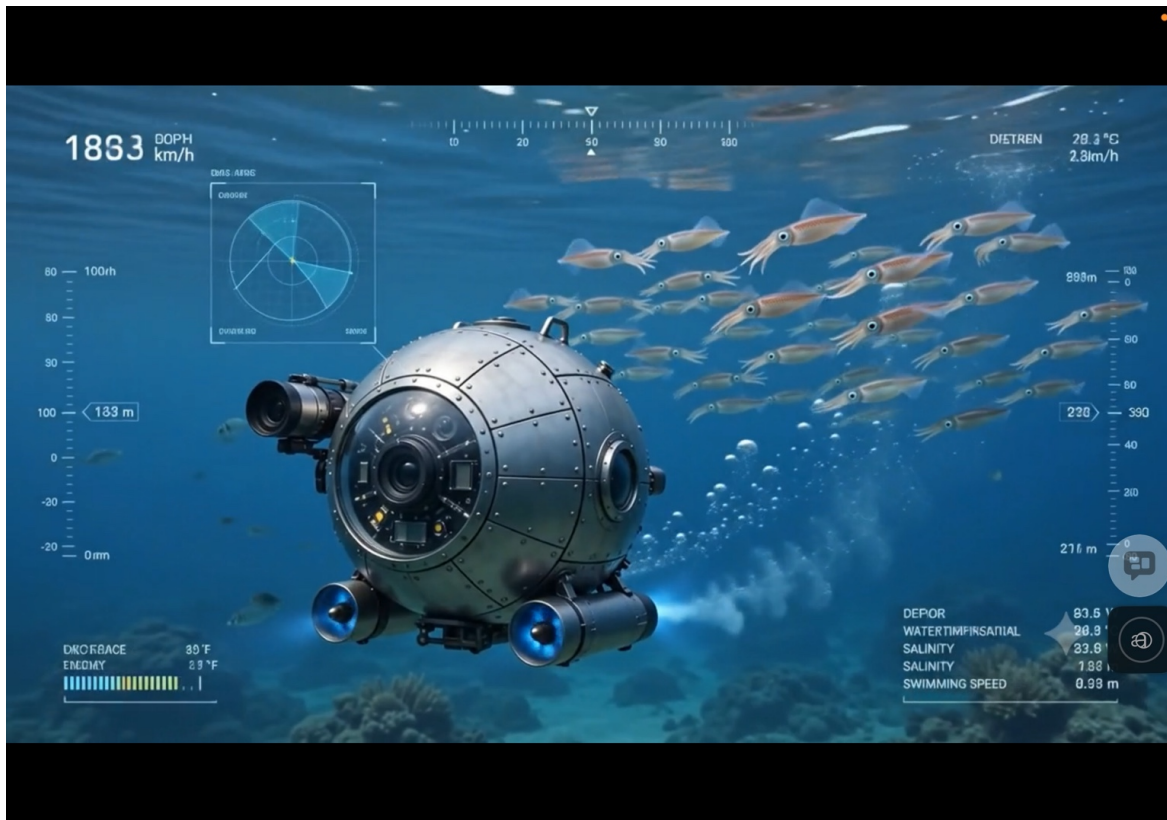
9. The School Is Reacquired



The probe quietly reacquires the school beneath the surface and records depth, temperature, salinity, current direction, ambient light, and movement.

The stronger question is not merely, 'Where are the squid?' It is: **What environmental conditions are associated with where the squid choose to go?**

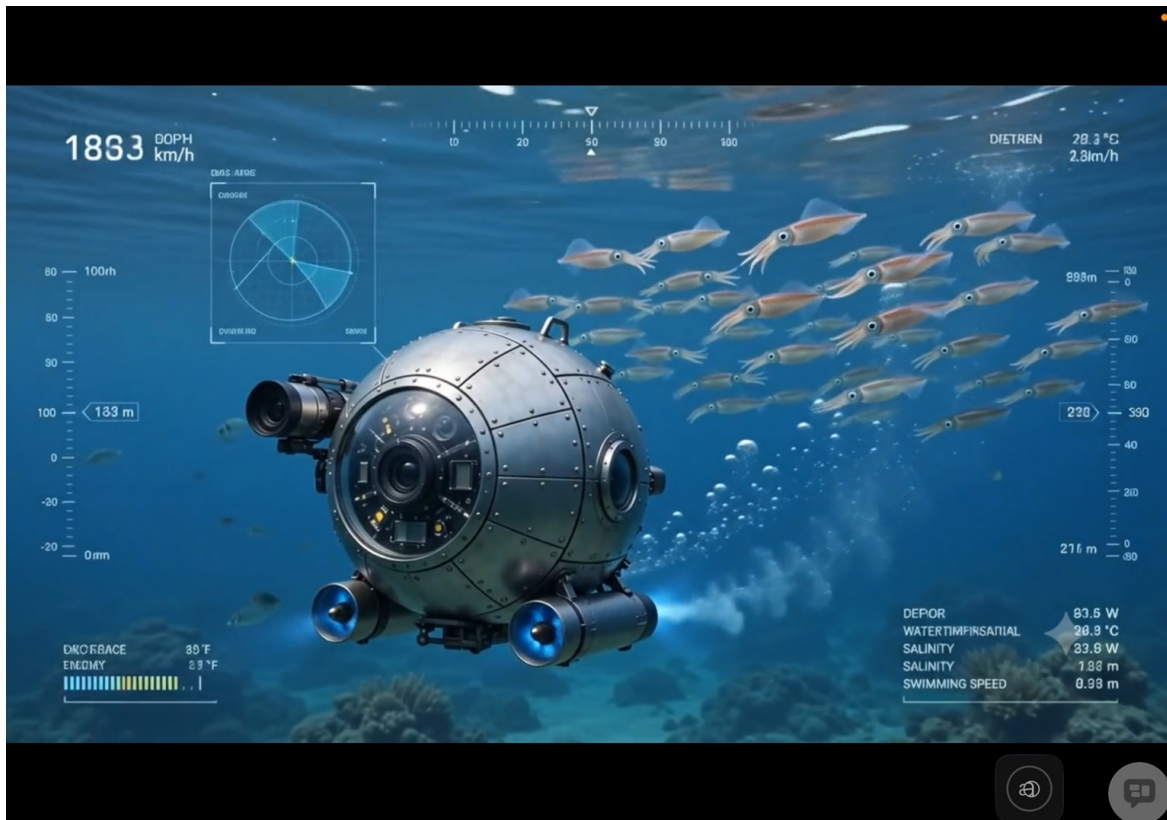
10. Following the Squid



The squid move as a school, changing direction and spacing. The probe stays back and records the group's motion rather than forcing the animals onto a particular path.

The aerial phase seen earlier begins with rapid underwater acceleration, emergence above the surface, a short glide, and re-entry.

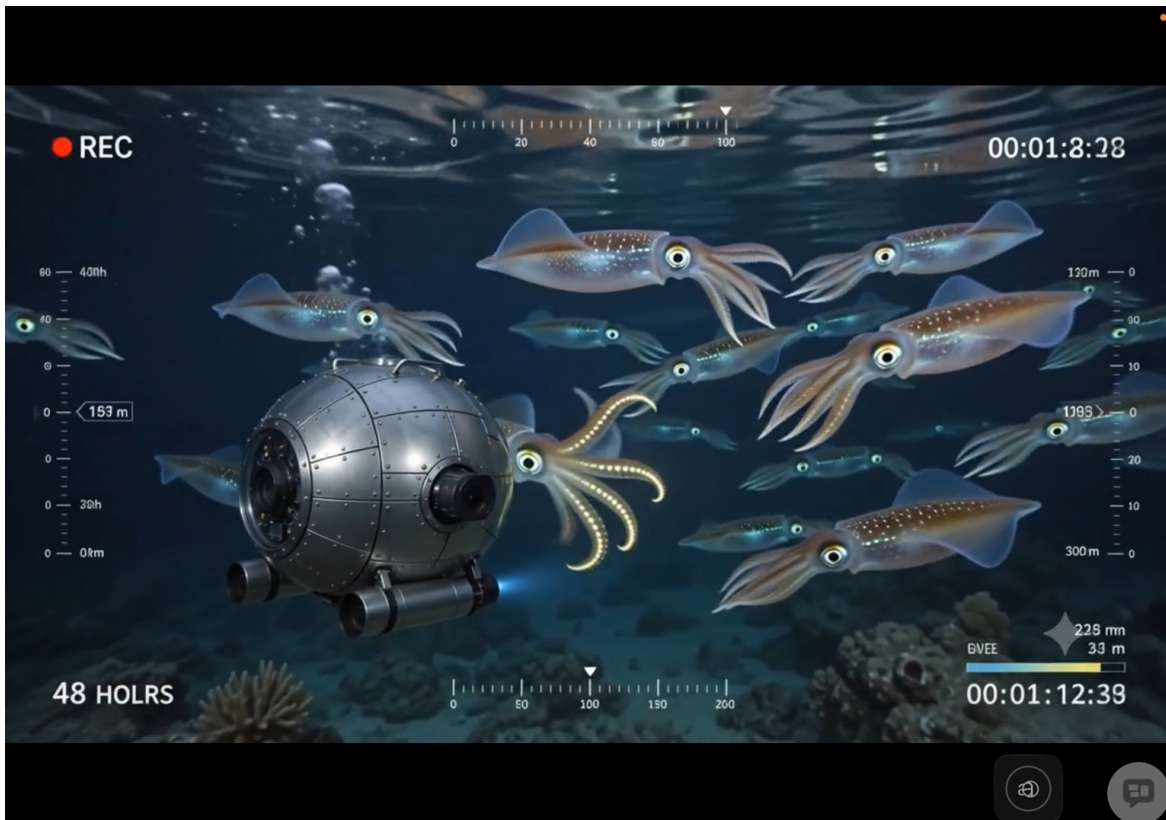
11. A 48-Hour Field Study



For two days, the mission follows the animals through changing conditions. Daylight fades, the water darkens, and the science team compares movement with depth, light, currents, and possible prey concentrations.

A 48-hour observation cannot reveal everything, but it can produce testable questions for a longer study.

12. Data Returns to Vanguard-6



Telemetry returns to the GMTO aboard Vanguard-6. The crew assembles observations into a movement map and looks for patterns.

The mission connects animal behavior with physics, oceanography, engineering, and biology.

Cadet Science Notebook

Surface Flight Observation

Use the flying-squid portion of the mission to record what you would measure.

Measurement	Cadet notes
Number emerging	_____
Airborne time	_____
Estimated glide distance	_____
Direction of travel	_____
Surface wind	_____
Ocean current	_____
Re-entry spacing	_____

Underwater Observation

Measurement	Why could it matter?
Depth	_____
Water temperature	_____
Salinity	_____
Current direction / speed	_____
Ambient light	_____
Squid swimming speed	_____
Prey concentration	_____

Mission Questionnaire

1. Why did Vanguard-6 descend from orbit to the Pacific observation zone?

2. What did the crew measure when the squid emerged above the surface?

3. Why should the scientists avoid immediately calling the movement 'formation flight'?

4. What is the difference between an observation and an interpretation?

5. Why did Vanguard-6 remain at a distance instead of following the squid underwater?

6. What was the advantage of the smaller GMTO submersible probe?

7. Name three underwater environmental measurements collected by the probe.

8. What does non-invasive observation mean?

9. Why is a 48-hour observation more useful than watching only one brief surface event?

10. Propose one hypothesis explaining why several squid might emerge in the same general direction.

11. What evidence would support your hypothesis?

12. What evidence would make you change it?

Cadet Mission Challenge

Connect the Air and the Ocean

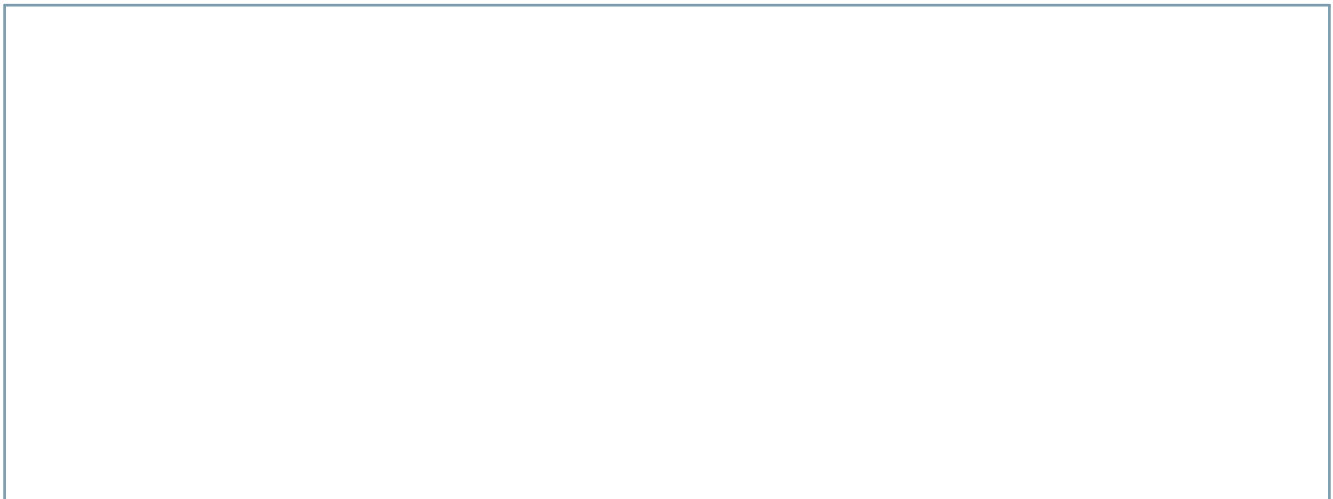
Choose one factor - current, wind, light, temperature, predators, or prey - and explain how it could influence both underwater movement and the squid's brief aerial glide.

My hypothesis:

Evidence I would collect:

Engineering Challenge

Sketch a future GMTO probe that can measure both the underwater school and the squid's emergence above the surface. Label at least four instruments.



Instructor / Cadet Answer Check

Key ideas: Vanguard-6 traveled to the Pacific to observe the reported behavior; surface measurements include count, airborne time, glide distance, direction, wind, current, and re-entry spacing. Scientists should measure repeated patterns before describing coordinated formation behavior. An observation records what is measured or witnessed; an interpretation explains what it may mean. The small probe reduces disturbance and collects close-range underwater data. A longer observation helps distinguish a repeatable pattern from a single event. Hypothesis answers may vary but should be testable with measurable evidence.

Mission Vocabulary

GMTO: Galactic Multidimensional Topology Observer.

Pelagic: relating to the open water of the ocean.

Telemetry: measurements transmitted from a remote instrument.

Salinity: the amount of dissolved salt in water.

Non-invasive: observing while minimizing disturbance.

Hypothesis: a testable proposed explanation or prediction.

Glide: movement through the air without sustained powered flight like a bird.

CADET ACADEMY PRINCIPLE: Observe carefully. Measure honestly. Protect what you study.