

SIX WORLDS. ONE CREW. YOUR EVIDENCE.

PLANET DETECTIVES!

Your field guide to finding a place humans could survive.



STUDENT FIELD GUIDE • NO ANSWERS GIVEN

Fly. Investigate. Compare. Make a case for your crew.



A fictional exploration game for Year 7 science. The worlds, measurements and power units are a simplified model, not a real spaceflight or engineering simulation.

Detective _____ Crew _____

YOUR MISSION

Keep the crew alive

A damaged mothership. Six humans. A temporary surface base for 30 days. You are the crew's planet detective.

Fly between six fictional worlds and investigate what humans would need at each one. A pretty view is a starting point for questions, not proof that a planet is safe.

You already have

- A sealed habitat.
- Basic solar panels and storage.
- 30 days of tested meals.
- Emergency air and water for 48 hours.
- Four bays for extra modules.

Your final decision

Rank all six worlds. Choose a top world, pack a workable survival kit and use probe evidence to explain your plan.

The game checks the equipment and power budget. You and your class judge how convincing the explanation is.

One expedition, six needs

Air · water · temperature · food · shelter · energy. A strong plan connects them. Solving one need can create another demand.

Find your way through this guide

Flight controls and investigation steps	3
Think like a scientist	4
Bloom · Frostbite · Dune	5-7
Murk · Sizzle · Puff	8-10
Rank the worlds	11
Pack and power the base	12
Our four-bay planning sheet	13
Make your case	14
Field glossary and exit ticket	15

Keep this guide beside the game. Record your own observations before comparing them with another crew. It contains no answer key or model ranking.

TAKE THE CONTROLS

Fly. Probe. Think.

You choose a destination, fly there, slow down and investigate. Selecting a planet signal sets a course; it does not move the rocket there.

Action	Keyboard	Pointer or touch
Fly forward	 or 	Hold on the space scene to steer and fly towards that direction.
Turn	 /  or  / 	Use the on-screen direction controls, or move your held pointer.
Brake	 ,  or 	Hold the square brake control.
Boost		Hold the lightning control.
Choose a waypoint	Use a focused destination control.	Choose a signal on the mini-map or a planet portrait.

Click or tap the game first so the keyboard controls have focus. Release thrust, brake and boost after each manoeuvre. Fly into the target's ring and slow down until the investigation action becomes available.

- 1 Launch the probe.** Keep the crew safe while the probe reveals six survival clues.
- 2 Inspect clues.** Tap a clue to read its measurement and what it means. Compare it with the other needs.
- 3 Make a call.** Choose the explanation supported by the evidence. Read the feedback and revise if needed.
- 4 Log the world.** Save the case, lift off and look for its completed stamp. Then explore the next signal.

Mini-map and passport

The map uncovers the space you explore. Stamps show completed investigations. Collectibles are flight fun, not a measure of your scientific explanation.

Need a reminder?

Use ? for the survival briefing. The animation control changes decorative motion; your investigation still continues.

DETECTIVE THINKING

What does the evidence allow?

An observation tells you what the probe measured. A claim says what you think. Reasoning connects the two.

Observation

“The sample contains a dissolved substance.”

This describes a measurement. Keep the unit, the conditions and any uncertainty.

Interpretation

“We need to investigate how to make the supply usable.”

This is an implication. Explain the connection, rather than treating it as a new measurement.

Six questions for every world

Air	Is there enough usable oxygen at a suitable pressure? What else is mixed in?
Water	Where is it? What state is it in? How could it be collected and made safe?
Temperature	How does it change? What must the habitat do through a whole day and night?
Food	What has actually been tested? How long will the crew’s existing supply last?
Shelter	Could the base stand there and protect people from the reported hazards?
Energy	What supplies power? Can the available equipment collect it and meet every load?

“Not tested” does not mean “definitely harmful”.

It means the crew lacks evidence to rely on it. Safety decisions must acknowledge what remains unknown.

Look for a chain

A material is present → the crew can access it → equipment processes it → the process needs power → a usable supply reaches the crew.

Check each link. A missing link is a question to solve, not permission to assume success.

Practise before you compare

One measurement I trust, one claim it supports and one limit to that claim

WORLD 1 • FIELD NOTEBOOK

Bloom

Blue water, green life and a welcoming shape on the map. Begin by noticing what the picture makes you expect. Then let the probe test that expectation.



Appearance and measurement

Evidence • atmosphere • dissolved substance

Before the probe

- What can a picture of a planet actually tell you?
- Which survival need would you measure before trusting a familiar appearance?

Investigate

Compare the air, water and temperature clues. Record an observation before writing what you think it means. If two clues seem reassuring, check whether a third clue changes your plan.

Your in-game call
Green life. Helmets off?

Air: the probe found...

Water: the probe found...

Temperature: the probe found...

Food: the probe found...

Shelter: the probe found...

Energy: the probe found...

After the investigation

- Did any measurement challenge your first impression? Explain the change.
- Which resource could the crew use directly, and which would need equipment first?

My strongest observation, what it means and what I still do not know

Compare with another world

Compare Bloom with one world that looks much less welcoming. Is appearance a fair reason to place either world higher?

WORLD 2 • FIELD NOTEBOOK

Frostbite

A bright, icy world circles into view. It looks full of a familiar material, but the crew needs a usable supply, not just a promising photograph.



States of matter and usable resources

Solid • liquid • change of state • energy

Before the probe

- How are ice and liquid water alike? How are they different?
- What questions sit between finding a material and safely using it?

Investigate

Read the water clue beside the temperature and energy clues. Think about the steps a sample would pass through before reaching a drinking cup. Separate a change of state from a test of safety.

Your in-game call

We found ice. Water problem solved?

Air: the probe found...

Water: the probe found...

Temperature: the probe found...

Food: the probe found...

Shelter: the probe found...

Energy: the probe found...

After the investigation

- Which steps would your crew need equipment for?
- Could a shelter solve every survival need by itself? Support your view with a clue.

My strongest observation, what it means and what I still do not know

Compare with another world

Compare Frostbite with a world where water is liquid. Explain why the state of the water is only one part of the comparison.

WORLD 3 • FIELD NOTEBOOK

Dune

Sand, sunlight and a wide landscape make Dune easy to recognise. A scientific plan must consider the whole cycle of conditions, including times the picture cannot show.



Variation, repeated measurements and planning

Range • minimum • maximum • groundwater

Before the probe

- When would you measure temperature if people had to stay for a whole day?
- What could an average hide?

Investigate

Read the complete temperature clue, not just its first number. Link the water reading to access and treatment. Check how the same equipment might need to work under different conditions.

Your in-game call

48 °C at noon. Enough to plan our base?

Air: the probe found...

Water: the probe found...

Temperature: the probe found...

Food: the probe found...

Shelter: the probe found...

Energy: the probe found...

After the investigation

- Which two readings matter when planning temperature control? Why both?
- What would you still want to measure before building a permanent settlement?

My strongest observation, what it means and what I still do not know

Compare with another world

Compare Dune with a world that has a smaller temperature range. Which extra equipment might the difference demand?

WORLD 4 • FIELD NOTEBOOK

Murk

Glowing colours and fungi-like shapes fill Murk. Your crew has never encountered its organisms before. Treat familiar-looking numbers and unfamiliar life as questions to investigate.



Mixtures, contamination and safe conclusions

Mixture • trace gas • microbe • ultraviolet

Before the probe

- Does one suitable ingredient prove that a whole mixture is safe?
- What is the difference between clear water and safe drinking water?

Investigate

Look at every part of the air reading. Then compare the water, food and shelter clues. Decide which statements are measured, which remain unknown, and which would need specialist equipment.

Your in-game call

21% oxygen. Can we take our helmets off?

Air: the probe found...

Water: the probe found...

Temperature: the probe found...

Food: the probe found...

Shelter: the probe found...

Energy: the probe found...

After the investigation

- Which clue would you explain to someone who wanted to rush outside?
- What tests would you request before treating a local organism as food?

My strongest observation, what it means and what I still do not know

Compare with another world

Compare Murk with another mild-looking world. Which hazards are different, even if their temperatures seem manageable?

WORLD 5 • FIELD NOTEBOOK

Sizzle

A volcanic world throws heat and colour into space. An exciting resource can distract an explorer from other needs. Ask whether the crew can reach, capture and use what it finds.



Resources, equipment and limits

Geothermal • solar • hazard • accessible

Before the probe

- What is the difference between an energy source and equipment that collects it?
- Could fixing one problem leave a different problem unsolved?

Investigate

Place the energy clue beside the shelter clue. Follow the water supply from its location to the proposed base. Keep an equipment list and check it against what the mission actually carries.

Your in-game call

Volcanic heat. Easy power for our base?

Air: the probe found...

Water: the probe found...

Temperature: the probe found...

Food: the probe found...

Shelter: the probe found...

Energy: the probe found...

After the investigation

- Which statement in your plan depends on equipment the crew really has?
- If you proposed new technology, would that still be the same mission? Explain.

My strongest observation, what it means and what I still do not know

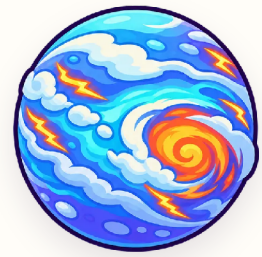
Compare with another world

Compare Sizzle with a world where conditions are less dramatic. Does having an impressive resource outweigh the work needed to use it?

WORLD 6 • FIELD NOTEBOOK

Puff

Puff is a world of huge swirling clouds. Before choosing somewhere beautiful, the crew must check that the kind of base it carries could work there at all.



Matching a solution to the mission

Gas giant • vapour • pressure • surface

Before the probe

- What would you need to know before choosing a landing site?
- What can and cannot be concluded from seeing clouds?

Investigate

Start with the shelter clue, then read air, water and temperature. Think about how conditions can change as a probe moves deeper. Do not add imaginary equipment to fill a gap in the evidence.

Your in-game call

Where can our ordinary habitat stand?

Air: the probe found...

Water: the probe found...

Temperature: the probe found...

Food: the probe found...

Shelter: the probe found...

Energy: the probe found...

After the investigation

- Which observation most changes the kind of mission you would plan?
- How would you distinguish a resource being present from a resource being usable?

My strongest observation, what it means and what I still do not know

Compare with another world

Compare Puff with any rocky world. Which differences affect an ordinary surface habitat, rather than just an astronaut passing through?

THE EXPEDITION COUNCIL

Rank all six worlds

Most suitable means most suitable for this crew, this surface habitat and this 30-day mission. It does not mean best in every possible future.

- 1 **Finish all six cases.** Review the full evidence, including the clues that surprised you.
- 2 **Compare the same needs.** Choose criteria before arguing for a favourite picture.
- 3 **Arrange the ranking.** Drag the numbered handles or use the up and down arrows. Your top choice determines the equipment and power plan.
- 4 **Defend the difficult positions.** Explain a trade-off between two worlds. Different middle rankings can be reasonable when their evidence is clear.

Rank	World	One decisive observation	What that means for our crew
1			
2			
3			
4			
5			
6			

Challenge your first choice

What is its biggest difficulty? Which module addresses it? What has the plan still left untested?

Be ready to revise

What new measurement would make you move a world? Changing a claim because of evidence is progress.

Do not rank by counting “good” clues alone. One essential requirement can outweigh several attractive features. Explain why it matters for this mission.

FOUR CARGO BAYS

Pack a base that works

Every module takes one bay. Choose up to four. Extra equipment has to fit the mission and the available power.

Module	What it provides in the model	Power
Air plant	Oxygen supply, CO ₂ removal, gas filters	1 used
Water lab	Pump, melt, desalinate, disinfect	1 used
Climate control	Heating and cooling · uses 2 power	2 used
Power pack	Extra generation + storage · adds 3 power	+3 available
Shielding	Additional radiation and weather cover	0 used
Seed lab	Long-term food trial · not instant meals	1 used

“Game power units” are a simplified budget. They are not watts or a real engineering calculation. Zero in the table means no additional load in this game model, not that real equipment never uses energy.

Available power

Top world's basic supply + extra power from a selected Power pack.

Our supply = _____ + _____ = _____

Demand

Add the loads of every selected module, including optional equipment.

Our demand = _____

Remember the time limit.

Tested meals cover the 30-day stay. Growing food is a longer-term trial, not an instant replacement. Emergency air and water only cover 48 hours.

Connect the equipment to the evidence

Choose a world and follow one survival need from the probe reading to a module. Explain why that module addresses the difficulty. Then check whether it changes the power plan.

A module is useful here because...

A module we might leave behind, and the trade-off...

CREW PLANNING SHEET

Our four-bay plan

Record the evidence behind the kit, not just the equipment names. Keep this sheet beside your final ranking.

Our top world: _____ Our priority: _____

Bay	Module	Probe evidence that makes it useful
1		
2		
3		
4		

Supply

Basic supply: _____

Extra supply: _____

Total: _____

Demand

Selected module loads:

Total: _____

Test the plan before submitting

- Have we investigated all six worlds?
- Does this world offer a site for the habitat our crew carries?
- Have we addressed every required survival need?
- Do the modules fit in four bays and within the power supply?
- Have we selected a priority and written an evidence-based comparison?

Another crew challenged us about...

We responded by changing or explaining...

YOUR FINAL CASE

Convince another crew

A survival plan needs a claim, accurate evidence, an explanation and an honest limit. You do not need to pretend every problem is solved.

Claim: Our strongest candidate for this mission is...

Evidence: The probe measured...

Reasoning: This matters for human survival because... Our chosen module helps by...

Comparison: We placed it above... because the same need is harder to meet there...

Limit: We would still want to test... before a longer stay.

Draft your case

Swap and challenge

- Underline the exact observation in another crew's explanation.
- Ask which piece of equipment addresses the stated difficulty.
- Check the power sum and the four-bay limit.
- Ask a question about an assumption, without criticising the person.

What the submit button can check

The game checks completed investigations, the modelled kit, power and that a priority and written case have been provided. It does not read your writing like a teacher. A success message is an invitation to discuss your evidence.

After the challenge, I changed or strengthened...

FIELD GLOSSARY

Words for your evidence

Use the term that fits the measurement. If you are unsure, describe what the probe found first.

Atmosphere

The mixture of gases around a world. A familiar oxygen percentage alone does not describe the whole mixture.

State of matter

A physical form such as solid, liquid or gas. Ice, liquid water and water vapour are forms of water.

Dissolved

Mixed into a liquid so that separate pieces may not be visible. Salt can dissolve in water.

Disinfection

A process used to reduce harmful microorganisms. It differs from simply changing water's state.

Trace gas

A gas present in a small amount. A small amount is not automatically harmless.

Solar / geothermal

Energy from sunlight / heat within a planet. Different equipment collects different sources.

Evidence / claim

An observation or measurement supporting a conclusion / the conclusion being argued.

Exit ticket

A belief I revised because of evidence

A survival need that depends on another need

The game's worlds and numerical budgets are invented for learning. Use your class's science resources to investigate real planets and engineering in more detail.

Pressure

How much force acts over an area. Air pressure affects whether breathing conditions are suitable.

Change of state

A physical change such as melting, freezing or evaporation. It does not by itself prove purity.

Desalination

Removing dissolved salts from water. It is one possible processing step.

Microbe

A very small organism. A water sample may need testing even when it looks clear.

Ultraviolet (UV)

A form of radiation. Appropriate protection depends on the exposure.

Resource / usable supply

Something present in an environment / something the crew can actually access and safely use.

Trade-off / uncertainty

A benefit accepted alongside a cost / something the evidence has not established.