Mars Greenhouse Registry

HOST ONLY - preparation and story

Includes answers. Keep these pages and all hint pages with the adult host.

Welcome to the Mars greenhouse. The planting bed must match the resources and conditions in the greenhouse registry. Your team has the original records on the table. First recover five pieces of information, then use the final plan to build the moon-bean growing bed. Keep every result beside its badge so another teammate can check your reasoning.

1. Print the six player sheets and two record sheets for each team. Keep answers and hints with the host.

2. Lay out Fictional food-web rules, Fictional field cards, the remaining clue sheets and the final plan. All task records are printed inside the sheets; no extra prop is needed.

3. After each clue, pass roles one seat clockwise. With two players, combine Reader with Recorder and Checker with Builder. With five or six, add a second checker and a source finder; everyone explains one decision.

4 players; 1 team. Give each team 6 player sheets and 2 record sheets. Share one host guide and one set of three hint levels.

Paper and pencils are enough. Keep whole sheets at one table; nothing needs cutting, folding or hiding.

Optional: 4 invitations or certificates, only if selected.

Mars Greenhouse Registry

HOST ONLY - solution guide

1. Food: MOTH

Propagate food availability from the printed starting food. The OR visitor has a supported food chain; the AND visitor lacks one food and the circular pair never gets started. Result: MOTH.

2. Habitat: MOSS

Compare feature values across all field cards. Apply positive and negative requirements together; only one complete feature set remains. Result: MOSS.

3. Delivery: 5

Known stock: 8 + 3 - 3 = 8. Closing stock 13 minus 8 gives the missing return 5. Cancelled +7 never arrived. Result: 5.

4. Plot: 8

B1, C2, C2, D3 reads SEED. The conversion table gives 8. Result: 8.

5. Weight: 2

Remove 1 from 7; share 6 among 3 parcels to get 2. Check 2 x 2 + 3 = 7. Result: 2.

6. Final: R2-F1-W2-D1-E2

Each recovered field result sets one separate habitat requirement. Match all five layers; a complete plan must include suitable cover, ground, water, food and access. Checked result: R2-F1-W2-D1-E2.

Mars Greenhouse Registry

HOST ONLY - timeline, story and ending

3 minutes: Read the opening. Show the evidence record and choose starting roles.

5 minutes: Solve Food. Offer one hint at a time and rotate roles after checking.

5 minutes: Solve Habitat. Offer one hint at a time and rotate roles after checking.

5 minutes: Solve Delivery. Offer one hint at a time and rotate roles after checking.

5 minutes: Solve Plot. Offer one hint at a time and rotate roles after checking.

5 minutes: Solve Weight. Offer one hint at a time and rotate roles after checking.

7 minutes: Build the five-part habitat design using all five results.

3 minutes: Read the ending. Ask each teammate to explain one rejected alternative.

After Habitat: A suitable roof does not guarantee suitable food or water. Keep each habitat need beside its field evidence. Pass the record sheet to a new checker before opening the next clue.

After Plot: Four results are recorded. Each teammate points to a source supporting one result. Complete the fifth check before building the five-part habitat design.

Check every result using the solution guide. Offer the next hint only when requested; save the answer reveal until the group is ready.

The paper model uses parts R2-F1-W2-D1-E2, with every habitat layer matched to its evidence. Thank each teammate for a different piece of reasoning.

Explain one tempting wrong choice and the evidence that ruled it out. Show how each of the five results affected the five-part habitat design. If a clue is missing, say what remains uncertain before reopening that sheet.

Duration and ages are estimates. Adjust the pace and offer help for your group.

Mars Greenhouse Registry

Player clue 1: Food | Team 1

The planting bed must match the resources and conditions in the greenhouse registry. We will use the records on the table to build the moon-bean growing bed. Share the reading, explain each choice and keep the five results for the final plan.

Use only the fictional food-web rules printed here. Start with the food available now. A creature becomes available when its food rule is met. Find which named visitor can live here; a loop cannot create its own first food.

Fictional food-web rules

NIB needs LEAF

PEEP needs SEED

MOTH needs NIB OR PEEP

GLIM needs NIB AND PEEP

LOOP needs TWIN

TWIN needs LOOP

Starting conditions

Available now: SEED.

A result becomes available when its needs are met.

Which of MOTH, GLIM, LOOP becomes available?

Food result: _____

Mars Greenhouse Registry

Player clue 2: Habitat | Team 1

These are fictional field cards for a paper model. Compare all the recorded conditions with the habitat requirements. A card that passes only one rule is not enough. Report the one card that meets every rule.

Fictional field cards

FERN: light=shade; floor=dry; entry=wide

MOSS: light=sun; floor=damp; entry=narrow

REED: light=shade; floor=damp; entry=wide

Required features

light must not be shade.

entry must be narrow.

Report the one matching card ID.

Habitat result: _____

Mars Greenhouse Registry

Player clue 3: Delivery | Team 1

Delivery desk: A return entry lost its amount. Use the opening and closing stock to find the missing return. Apply DONE entries; ignore the CANCELLED plan.

Opening stock: 8. Closing stock: 13.

Received: +3 DONE
Planned: +7 CANCELLED
Issued: -3 DONE
Returned: ? DONE

Missing return = ? units. Ignore cancelled plans.

Delivery result: _____

Mars Greenhouse Registry

Player clue 4: Plot | Team 1

Plot desk: Read the letter at each coordinate, in order. Letter = column; number = row. Convert the complete word using the printed table.

Columns: A, B, C, D. Rows: 1, 2, 3.

1	**B**	**S**	**H**	**L**
2	**G**	**K**	**E**	**R**
3	**M**	**Q**	**T**	**D**

SEED = 8

BEAM = 1

DOCK = 4

READ COORDINATES IN ORDER:

B1 > C2 > C2 > D3

Plot result: _____

Mars Greenhouse Registry

Player clue 5: Weight | Team 1

Weight desk: Every parcel has the same whole-number weight. Remove loose units, find ONE parcel and check the second rule.

3 parcels + 1 loose units = 7 units

2 parcels + 3 loose units = 7 units

One parcel = ? units. Whole numbers 1-9.

All parcels have equal weight.

Weight result: _____

Mars Greenhouse Registry

Player clue 6: Final | Team 1

Recover one requirement for each habitat layer from its named result. Choose a matching roof, floor, water source, food and entry. Write the five part IDs in the printed layer order, then point to the evidence supporting each choice.

Use your results from: Food, Habitat, Delivery, Plot, Weight.

Habitat construction key
Roof (Food): GLIM=shade; MOTH=sun
Floor (Habitat): MOSS=dry; FERN=damp
Water (Delivery): 5=flow; 12=still
Food (Plot): 1=seed; 8=leaf
Entry (Weight): 1=wide; 2=narrow
Parts (one per layer, top to bottom)
Roof: R2=sun; R1=shade
Floor: F1=dry; F2=damp
Water: W2=flow; W1=still
Food: D1=leaf; D2=seed
Entry: E2=narrow; E1=wide
Build rule
Choose each part meeting its recovered requirement.
Report five part IDs top to bottom, with hyphens.

Final result: _____

Ask your host to check your final result and read the ending.

Mars Greenhouse Registry

Hint level 1 - HOST ONLY

1. Food

Start with the available-food line, not with the visitor names.

2. Habitat

Place a finger on the same feature in each field card.

3. Delivery

Find opening stock, closing stock and the DONE or CANCELLED marks.

4. Plot

Find the column letters and row numbers on the grid.

5. Weight

Find the equal parcels and the separate loose units.

6. Final

Keep the five named results beside the final plan and find the key for each badge.

Mars Greenhouse Registry

Hint level 2 - HOST ONLY

1. Food

AND needs both foods. OR needs either food. A circular pair still needs an outside starting food.

2. Habitat

A "must not" rule removes a match; it does not ask you to look for that feature.

3. Delivery

Only completed entries change stock. A cancelled plan cannot be added or subtracted.

4. Plot

A coordinate gives column first and row second; keep the printed coordinate order.

5. Weight

Remove the loose units before sharing the remaining weight among equal parcels.

6. Final

Each badge controls a different fact, road leg, order note, pulse or habitat layer. Use the matching key exactly once.

Mars Greenhouse Registry

Hint level 3 - HOST ONLY

1. Food

Mark each creature whose food is already available; repeat until no new creature can be marked. Then compare only the listed visitors.

2. Habitat

Test every remaining card against all requirements. Explain the particular requirement each rejected card fails.

3. Delivery

Apply every known completed change to opening stock. Compare that result with closing stock to recover the missing completed return.

4. Plot

Read the full word before using the conversion table. If the word is missing, recheck each row and column rather than choosing a similar word.

5. Weight

Find one parcel from the first equation, then substitute that weight into the second equation before recording it.

6. Final

Check the completed product against all five recovered facts. If two answers remain, locate the fact that distinguishes them rather than guessing.

Mars Greenhouse Registry

Team 1 result record

Write the complete result from each clue. Results can be words, routes, orders, settings or numbers.

Food: _____

Habitat: _____

Delivery: _____

Plot: _____

Weight: _____

Keep this record beside the final clue. Copy results exactly, including any leading zero.

Reader / Recorder / Evidence checker / Route or model builder

After each clue, pass roles one seat clockwise. With two players, combine Reader with Recorder and Checker with Builder. With five or six, add a second checker and a source finder; everyone explains one decision.

Mars Greenhouse Registry

Team 1 final result and celebration

Our final challenge: Final

We combined our earlier clues to decide:

_____

_____

We know it works because:

_____

_____

Host: compare the result with your solution guide. Read the ending when it matches, then let the team explain one discovery.

No physical lock or prize is required. Draw a celebration star here if you like.

Mars Greenhouse Registry

You're invited to a mystery!

Join Birthday Explorer for Mars Greenhouse Registry.

The planting bed must match the resources and conditions in the greenhouse registry. Work together to build the moon-bean growing bed.

Date: _____

Time: _____

Place: _____

Bring your curiosity. Paper and pencils are provided. Share ideas and solve six clues together.

Designed for ages 8-10. Estimated 35-50 minutes.

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Mars Greenhouse Registry

Mystery Explorer

Presented to Birthday Explorer

Team member: _____

For completing Mars Greenhouse Registry with curiosity, teamwork and kindness.

The paper model uses parts R2-F1-W2-D1-E2, with every habitat layer matched to its evidence. Thank each teammate for a different piece of reasoning.

Date: _____

Host signature: _____

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