Dusk Observatory Shift

HOST ONLY - preparation and story

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

Welcome to the dusk observatory. The crew needs a slot long enough for setup and travel before the observing window closes. Your team has the original records on the table. First recover five pieces of information, then use the final plan to rebuild the dusk observing schedule. 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 Departure windows (minutes after opening), Event 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.

Dusk Observatory Shift

HOST ONLY - solution guide

1. Window: DUSK

Add job time and travel time to each printed start. Compare the sum with both that window's end and the deadline, then reject early starts. Result: DUSK.

2. Order: D

The before relationships connect all four events. Place linked cards, check any immediate handoff and then read the specified position. Result: D.

3. Record: KITE

Check source status first, then join the matching tag and bay. The useful information comes from separate records, not their printed row order. Result: KITE.

4. Signal: WAIT-TURN

A consistent one-to-one mapping satisfies every training example. Use the complete mapping to read the two-signal message in order. Result: WAIT-TURN.

5. Food: SKETCH

Start with listed stock. Follow the printed dependencies until no new component becomes available; a circular dependency cannot create its first input. Result: SKETCH.

6. Final: B-D-A-F-C-E

The five recovered order notes link all six events. Arrange them into one continuous order. Removing any link leaves two neighboring sections without a known order. Checked result: B-D-A-F-C-E.

Dusk Observatory Shift

HOST ONLY - timeline, story and ending

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

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

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

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

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

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

7 minutes: Build the six-event run sheet using all five results.

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

After Order: One time window can fit the work but fail the journey. Keep each order note beside its source. Pass the record sheet to a new checker before opening the next clue.

After Signal: Four results are recorded. Each teammate points to a source supporting one result. Complete the fifth check before building the six-event run sheet.

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

The crew uses run sheet B-D-A-F-C-E; every recovered order note is respected. 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 six-event run sheet. 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.

Dusk Observatory Shift

Player clue 1: Window | Team 1

The crew needs a slot long enough for setup and travel before the observing window closes. We will use the records on the table to rebuild the dusk observing schedule. Share the reading, explain each choice and keep the five results for the final plan.

The team needs time for both the job and the journey. It cannot start before the earliest time, leave a window unfinished, or arrive after the deadline. Which departure window works? Times are minutes after opening.

Departure windows (minutes after opening)

DAWN: start 5; window ends 30

DUSK: start 18; window ends 36

NIGHT: start 26; window ends 50

NOON: start 15; window ends 25

Work and travel

Earliest start 12; job 9 min.

Travel 7 min; arrival deadline 38.

Job + travel must both fit inside one window.

Report the only possible window ID.

Window result: _____

Dusk Observatory Shift

Player clue 2: Order | Team 1

Arrange the four event cards using every witness note. "Immediately before" means there is no event between them. Report the requested position after the whole order has been checked.

Event cards

A: Aim lens

B: Make sketch

C: Open dome

D: Set focus

Witness notes

D is immediately before B.

A is before D.

C is immediately before A.

Report the event ID in position 3.

Order result: _____

Dusk Observatory Shift

Player clue 3: Record | Team 1

A dome entry was corrected after the first chart. Check the observer status, match tags and follow only the current dome entry before reading the final seal. The superseded row remains on the paper trail.

Observer slips
item: Dome | tag: PINE | status: cancelled
item: Lens | tag: WAVE | status: draft
item: Desk | tag: STAR | status: checked
Dome register
tag: STAR | bay: NORTH | version: current
tag: PINE | bay: EAST | version: current
tag: WAVE | bay: WEST | version: current
tag: STAR | bay: EAST | version: superseded
Sky note
bay: WEST | seal: RING
bay: NORTH | seal: KITE
bay: EAST | seal: LEAF
Cross-check
Match A.tag to B.tag.
Match B.bay to C.bay.
A.status is checked.
B.version is current.
Report C.seal.

Record result: _____

Dusk Observatory Shift

Player clue 4: Signal | Team 1

Recover the complete desk-signal legend from the training cards. The printed word order matches signal order; any unused word belongs to the remaining signal. Decode the received message in order. The desk uses this message when handling the twilight observing run.

Unlabelled legend

Signals: DOT, BAR, ARC, RING. Words: WAIT, SEND, TURN, REST.

Each signal has one word; each word is used once.

Training messages

ARC+DOT+BAR means REST+SEND+TURN

Received message

RING > BAR

Report decoded words in order, with hyphens.

Signal result: _____

Dusk Observatory Shift

Player clue 5: Food | Team 1

The observing team has only the listed supplies. Follow the readiness cards to find which observation can be completed. Some stages need both inputs, and an expected delivery is not already in stock.

Observatory readiness cards

LAMP needs CELL

AIM needs CHART

SKETCH needs LAMP AND AIM

PHOTO needs LAMP AND FILM

FILM needs DELIVERY

Starting conditions

Available now: CELL, CHART.

A result becomes available when its needs are met.

Which of SKETCH, PHOTO, FILM becomes available?

Food result: _____

Dusk Observatory Shift

Player clue 6: Final | Team 1

Each recorded result recovers one order note. Use all five notes to put the six named events in order. A>B means A happens before B. Write all six event IDs from first to last; check that every note is satisfied.

Use your results from: Window, Order, Record, Signal, Food.

Run sheet
A: Set focus
B: Open dome
C: Cover lens
D: Aim lens
E: File chart
F: Make sketch
Recovered order notes
Window: DUSK=B>D; DAWN=D>B
Order: A=A>D; D=D>A
Record: KITE=A>F; RING=F>A
Signal: WAIT-SEND=C>F; WAIT-TURN=F>C
Food: SKETCH=C>E; PHOTO=E>C
Order rule
A>B means A happens before B. Use all five notes.
Report all six event IDs in order, with hyphens.

Final result: _____

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

Dusk Observatory Shift

Hint level 1 - HOST ONLY

1. Window

Look at earliest start, each window end and the arrival deadline.

2. Order

Read the event letters and all three witness notes.

3. Record

Start with the status field in Observer slips.

4. Signal

Look at the training cards that share one signal.

5. Food

Find the stock line and the readiness cards.

6. Final

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

Dusk Observatory Shift

Hint level 2 - HOST ONLY

1. Window

The journey uses time as well as the job; add both to the start of each window.

2. Order

Join immediately-before pairs as a block; other before notes set the direction between blocks.

3. Record

The tag links an item to a bay; rows in separate records need not line up.

4. Signal

In an unordered pair, a word cannot be assigned by its left/right position. Use the overlap with another pair.

5. Food

AND needs every input; OR needs one. A future delivery is not current stock.

6. Final

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

Dusk Observatory Shift

Hint level 3 - HOST ONLY

1. Window

Check all three conditions for each window. A slot can be long enough yet start too early or arrive too late.

2. Order

Try the remaining positions, then check every note against your full order before reading the requested position.

3. Record

Keep only entries meeting every status test. Follow each printed join to the report field; do not guess from row position.

4. Signal

Give each signal a different word, check every training example and only then decode the received message in its printed order.

5. Food

Mark supported components in rounds. Stop when no further component can be marked and compare the proposed results.

6. Final

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

Dusk Observatory Shift

Team 1 result record

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

Window: _____

Order: _____

Record: _____

Signal: _____

Food: _____

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.

Dusk Observatory Shift

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.

Dusk Observatory Shift

You're invited to a mystery!

Join Birthday Explorer for Dusk Observatory Shift.

The crew needs a slot long enough for setup and travel before the observing window closes. Work together to rebuild the dusk observing schedule.

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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Dusk Observatory Shift

Mystery Explorer

Presented to Birthday Explorer

Team member: _____

For completing Dusk Observatory Shift with curiosity, teamwork and kindness.

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Date: _____

Host signature: _____

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