



Instructor's Guide to Monty Hall Problem

Laboratory implementation, theoretical foundations,
experimental evidence, and variants

Behavioral and Experimental Economics Research Lab
Department of Economics



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<https://beer-lab.org/>

How to use this guide

This guide covers the basic and extended Monty Hall family. It is written for instructors who are not probability, Bayesian-statistics, or behavioral-economics specialists.

Opening chapters support configuration, session creation, and participant operation. Theory chapters derive the benchmark in several ways, explain its dependence on the host protocol, and connect results to experiments. Final chapters supply debrief scripts, worked examples, class plans, report guidance, and troubleshooting.

The activity is not designed to make students memorize that “switching is better.” Students should state the rules under which the claim is true, identify what the host’s action communicates, and explain why two closed doors need not be equally likely. The report compares a prediction with a distribution and a learning path. It must never label an individual’s ability.

Author

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For the instructor

Before class, read the quick guide, protocol explanation, and selected variant. Do not reveal the solution before a condition intended to measure initial intuition.

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Quick guide

1.1 Access through the updated laboratory website

Start at <https://beer-lab.org/en/>. Select **CLASSROOM** in the top navigation menu; it opens <https://teaching.beer-lab.org/en/>. In the **Classroom experiments** catalog, use the search box to locate the activity by name. You can also filter by **Topic** or **JEL code**. Clear any filters left from an earlier search before looking for another game.

Each family's card distinguishes **Español** and **English** access links. The **Show extended version** checkbox selects that edition before following a link. Catalog language and session language are separate choices: verify both. Students use the room specified by the instructor; the instructor prepares and monitors the session through this family's own administrative pages.



Figure 1.1: Current institutional website. Select CLASSROOM in the top navigation menu to open the teaching experiments. Captured on October 7, 2026.



Figure 1.2: Current catalog: search by title, topic, or JEL code. Then locate this family's card and select language and edition. Captured on October 7, 2026.

Checking resources, comprehension, and participant requirements

Before opening the room, check the selected configuration and the number of students present. The session-creation form states the group size and minimum required by that configuration. An individual activity accepts any positive participant count; an interactive activity must satisfy its stated requirement: complete groups when size is fixed, or a minimum participant count when size is flexible. Requirements may change across treatments, for example when adding a third party or changing an institution's size. If you edit a grouping parameter, check the requirement for the edited configuration, rather than relying only on the demo's suggested count.

In the instructions, ensure that students can identify what each role receives, what they can decide, and how the outcome is calculated. An initial account, a distributable budget, and final earnings need not be the same amount. Refer to the resources panel and the example for the selected treatment. Do not carry the basic edition's endowment into a treatment that changes accounts or introduces additional positions.

ECU stands for *Experimental Currency Units*: the activity's unit of account. An outcome of 100 ECU does not automatically equal 100 pesos or 100 dollars. Conversion depends on the session configuration. Before announcing a payment, confirm with the laboratory whether money is paid, the conversion rate, and which decisions count for payment. In hypothetical modules, describe amounts as outcomes in the stated situation.

When a comprehension check is included, an incorrect response receives an explanation beside that question, identifying the submitted answer and the correct answer. Other answers remain in the form. Ask the student to return to the example, locate the relevant rule, and redo the calculation before correcting the response. Avoid revealing answers to the entire class for an individual error, and do not interpret a comprehension mistake as an economic choice in the game.

— una decisión	Problema de Monty Hall / Monty Hall Problem — BEER Lab Seleccione una variante de este juego. Select a version of this game.
— 10 decisiones, retroalimentación inmediata	
— 10 decisiones, retroalimentación demorada	
— one decision	
— 10 decisions, immediate feedback	
— 10 decisions, delayed feedback	
extendido — referencia, una decisión	
extendido — referencia, 10 decisiones con retroalimentación	
extendido — referencia, 10 decisiones con retroalimentación demorada	
extendido — diez puertas	
extendido — frecuencias naturales	
extendido — transferencia visual de probabilidad	
extendido — presentador no informado	
extendido — protocolo de revelación sesgado	
extendido — elicitación de creencias, retroalimentación demorada	
onty Hall — baseline, one decision	
onty Hall — baseline, 10 decisions with feedback	
onty Hall — baseline, 10 decisions with delayed feedback	
onty Hall — ten doors	
onty Hall — natural frequencies	
onty Hall — visual probability transfer	
onty Hall — uninformed host	
onty Hall — biased reveal protocol	
onty Hall — belief elicitation, delayed feedback	

Figure 1.3: Demo contains only the configurations of this game family, in both languages and editions.

Rooms

Current rooms:

[ES] Monty Hall
[EN] Monty Hall
[ES] Monty Hall: extendido
[EN] Monty Hall: extended

Figure 1.4: Rooms contains the four rooms for this family: basic and extended editions in Spanish and English.

Room: [EN] Monty Hall

Create a new session

Session Config

[EN] Monty Hall — one decision



Number of participants

Individual decisions: any positive participant count is allowed.

Create

[Configure session](#)

App sequence

monty_hall_game (10 rounds)

Bilingual Monty Hall teaching activity with protocol and learning treatments.

Figure 1.5: Session-creation form for the basic English room. Check the selected configuration and participant requirement before creating the session.

Downloading a session with several rounds

For the instructor

Open **Data** within the relevant session and use that session's CSV or CSV-for-Excel download link. The general export has one row per participant and columns for the different rounds. Ten rounds do not necessarily mean ten rows per person. When the family provides its own long-format export, observations may instead be organized by participant and round or another unit defined by the design.

Save the original file together with the configuration name, session code, and active-round count. Check that columns for the last active round are present and that the data belong to the selected session. Empty cells can represent inactive rounds, a pending decision, or a field that does not apply to a role; do not automatically recode them as zeros. To compare learning, preserve round and group identifiers alongside participant identifiers. Share only anonymous aggregates in class, and record session incidents before constructing derived tables.

Purpose	Teach conditional probability, Bayesian updating, selected information, learning, and protocol-dependent inference.
Experimental unit	One person. There are no partners, social roles, or wait pages. Each round has an independent prize location.
Decision	Select an initial door; observe the reveal; stay or switch when the protocol permits a second choice.
Basic edition	One decision; ten with immediate feedback; ten with delayed feedback.
Extended edition	Baselines, ten doors, natural frequencies, visual transfer, uninformed host, biased reveal, and beliefs.
Payoff	100 ECU for a win and 0 ECU for a loss.
Students EN	/room/monty_hall_en
Instructor	/demo
Local test	<code>localhost:8032/demo</code> with <code>GAME_FAMILY=montyhall</code> .
Topics	conditional probability; Bayesian updating; learning; judgment biases; behavioral economics.
JEL	C91; D83; D91.

Attention

The `montyhall.beer-lab.org` domain and routes are proposed for deployment. They require dedicated DNS, an oTree process, and a PostgreSQL database. The verified local instance works only on the computer running oTree.

1.2 Learning objectives

Students should enumerate the sample space; derive staying and switching probabilities; explain the reveal as a selected action; apply Bayes; generalize to ten doors; distinguish conditional and unconditional results; predict an uninformed host; interpret round learning; separate comprehension, belief, and action; and design a discriminating treatment.

Canonical problem and protocol

2.1 Round sequence

There are three doors, one 100-ECU prize, and two empty locations. The computer places the prize uniformly. The contestant chooses an initial door. The host knows the location, never opens the chosen door, always opens an empty door, and always offers a switch to the only other closed door. The contestant stays or switches and wins when the final door contains the prize.

All host conditions belong to the model. Merely saying that a door opens is insufficient. A host who can reveal the prize, sometimes withholds the switch, or acts adversarially generates different evidence. Under the canonical protocol, a wrong initial choice forces the host to open the only other empty door. That restriction preserves on the alternative the probability attached to all wrong initial choices.

2.2 Complete-strategy derivation

The initial choice is right with probability $1/3$ and wrong with $2/3$. Staying wins exactly when it is right. Switching wins exactly when it is wrong because the host removes the other losing door. Staying wins one state out of three and switching two. This classifies states from the start; probability need not physically move.

If door 1 is selected, prize at 1 makes staying win. Prize at 2 makes the host open 3 and switching win. Prize at 3 makes the host open 2 and switching win. Host randomization when the initial door contains the prize changes which empty door is shown but not the ex-ante success of a complete strategy.

For the instructor

Collect a private prediction before calculation. Record stay, switch, and indifference counts without correction. After the activity, return to the distribution and ask which assumption changed for anyone who revised the answer.

2.3 Bayes and selection

Suppose door 1 was chosen and door 3 opened. With prize at 1, the host could open 2 or 3: $P(A_3 | C_1) = 1/2$. With prize at 2, opening 3 is forced: $P(A_3 | C_2) = 1$. With prize at 3, it is

impossible. Equal priors imply

$$P(C_1 | A_3) = \frac{(1/2)(1/3)}{(1/2)(1/3) + (1)(1/3)} = \frac{1}{3}, \quad P(C_2 | A_3) = \frac{(1)(1/3)}{(1/2)(1/3) + (1)(1/3)} = \frac{2}{3}.$$

The reveal matters because its probability depends on location. Treating it as independent erases information and yields the intuitive 1/2–1/2 response.

The rule used when two empty doors are available must be specified. A different rule can change the posterior for a particular opened door even when unconditional switching remains superior under an informed host who never reveals the prize and always offers a switch. The biased protocol separates ex-ante strategy from posterior action.

2.4 Ten doors

With N doors, the initial choice is correct with $1/N$. The host opens $N - 2$ losing doors and leaves the original and one alternative. Staying wins with $1/N$ and switching with $(N - 1)/N$. Ten doors yield 10 and 90 percent. The larger contrast makes initial error intuitive without changing the mechanism.

2.5 Protocols, learning, and behavior

2.6 Uninformed host

An uninformed host randomly opens an unchosen door and can reveal the prize. A prize reveal ends the round. Conditional on an empty reveal, the closed doors are equally likely under the implemented rule. Continuation has selected states. Switching rates use only eligible rounds, while prize reveals require separate reporting.

2.7 Feedback

Immediate feedback shows prize and outcome after every round. It supports learning but short runs contain luck. Several switching losses may make a participant abandon a superior strategy. Delayed feedback hides outcomes until completion and isolates reflection or familiarity. Causal feedback comparisons require comparable assignment.

2.8 Behavioral explanations

Initial staying can reflect equiprobability, attachment to the first choice, anticipated regret, mistrust, strategic interpretation, or misunderstanding. One choice cannot separate them. Belief elicitation partly separates representation from action: a stated 67 percent can coexist with staying, while 50 can coexist with exploratory switching.

[Granberg and Brown \(1995\)](#) document low initial switching and experience. [Friedman \(1998\)](#) studies institutional construction and deconstruction. [Palacios-Huerta \(2003\)](#) examines incentives, ability, and social interaction. [Krauss and Wang \(2003\)](#) analyze natural frequencies and mental models. [James et al. \(2018\)](#) study transparent probability merging.

2.9 Access and family architecture

Start at <https://beer-lab.org/>, open <https://teaching.beer-lab.org/>, and select Monty Hall. Its domain must expose only 24 family configs and four rooms.

Basic ES	/room/monty_hall_es
Basic EN	/room/monty_hall_en
Extended ES	/room/monty_hall_extendido
Extended EN	/room/monty_hall_extended
Instructor	/demo

Rooms provide stable participant routes; individual links are temporary. If a reset makes a participant link invalid, create a new session. Select configuration, verify count, create the session, keep Monitor and Report open, and share only the intended route.

Participant path



Welcome to the BEER Lab

The Behavioral and Experimental Economics Research Lab in the Department of Economics at Tecnológico de Monterrey is a space for learning about economic decision making through controlled activities.

In this activity you will make decisions under uncertainty and observe how the host's information changes what can be inferred.

General laboratory rules

- Remain silent throughout the activity.
- Do not talk or look at other participants' decisions.
- Make your decisions individually and privately.
- Do not refresh, close, or leave this page.
- If you have a problem, raise your hand and wait quietly for help.

I understand and will follow these rules.

- ☐ Sí
☒ No

Figure 3.1: Institutional welcome and laboratory rules.

Instructions identify doors, host knowledge, reveal rule, prize, and feedback. Never replace them with an oral explanation that mixes protocols.



Instructions

Instructions

Resources and unit of account

ECU stands for Experimental Currency Units. It is the unit of account for this activity.

This session does not convert ECU into real money.

There are 3 doors and one contains a prize of 100 ECU. The host knows where the prize is, never opens your initial door, and always opens 1 door(s) without the prize. The host then offers you the choice to stay or switch to the only other closed door.

100 ECU



You will not see each round's result; all results will be shown at the end.

Continue

Con tecnología de [oTree](#)

Figure 3.2: Current instructions for the basic edition: initial resources, decision rules, and experimental units.

Comprehension check

Review the marked questions. Each shows your answer and an explanation; your other answers are retained.

Comprehension check

33% / 67%

Does the host know where the prize is?

☐ Yes ☒ No

Your answer: No. The correct answer is Yes. Review the protocol and probabilities. The information can only be interpreted from the rule followed by the host.

Under this protocol, what is approximately the percentage probability of winning by staying?

33

Under this protocol and when a choice is available, what is approximately the percentage probability of winning by switching?

67

Continue

Con tecnología de [oTree](#)

Figure 3.3: Current comprehension check with an incorrect answer, its specific explanation, and retained responses.

Initial choice

Initial choice

Round 1 of 1

Select a door. You do not yet know where the prize is.

DOOR

1

DOOR

2

DOOR

3

Confirm initial door

Con tecnología de [oTree](#)

Figure 3.4: Private initial choice.



The host opens 2
The host opens 2

2

The opened door(s) do not contain the prize.

Your initial door

Door 1

Stay

×

2

Other closed door

Door 3

Switch

Do you want to stay with your initial door or switch to the other closed door?

Confirm decision

Con tecnología de [oTree](#)

Figure 3.5: Final choice after reveal.



Activity complete
Activity complete

100,0 ECU
Total earnings

These are your decisions and outcomes. Keep this page open until the instructor closes the session.

#	Your initial door	Strategy	Prize door	Outcome	ECU
1	1	Switch	3	Won	100,0

Con tecnología de [oTree](#)

Figure 3.6: Explicit completion with strategy, prize, and ECU.

Instructor report and debrief

Before reveal, Report shows participants, expected, completed, and pending decisions. After reveal it displays switching, staying, success, benchmark, round trajectory, success by strategy, first versus last round, beliefs, and variant comparisons.

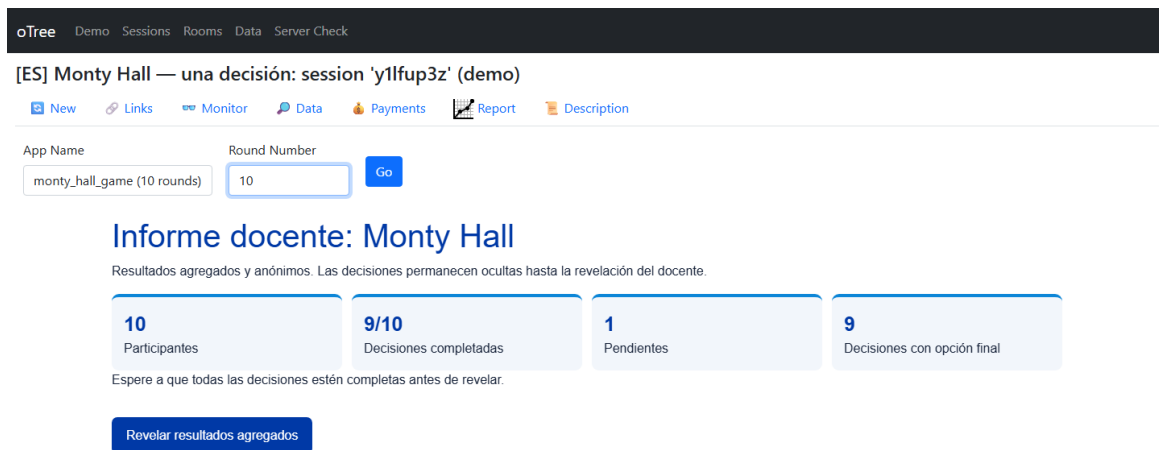


Figure 4.1: Report before aggregate reveal.

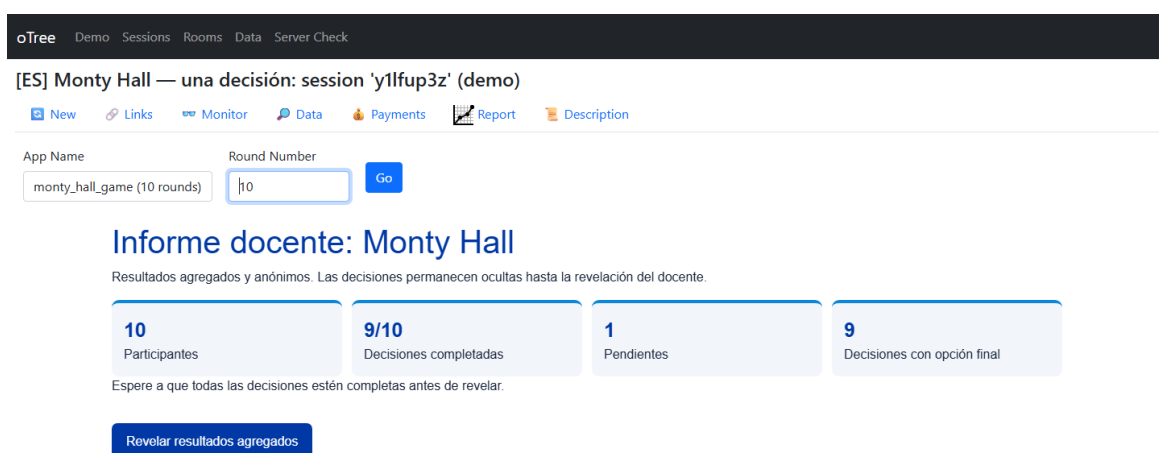


Figure 4.2: Revealed report with denominators.

Feedback script

Confirm coverage. Ask the class to describe switching. Compare success by strategy with $1/3$ and $2/3$ while noting sampling variation. Show the trajectory and ask whether it suggests learning. Introduce rival explanations and a discriminating treatment. End with the full host protocol in one sentence.

Ten decisions from one person are not ten independent people. The report supports descriptive feedback. Formal analysis must preserve longitudinal structure and participant-level dependence. A superior strategy can lose a round; realization and decision quality are different.

Extended variants and their use

5.1 Ten doors

Mechanism. The host opens eight empty doors and leaves one alternative.

Prediction. Staying wins with 10 percent and switching with 90.

Teaching readout. Compare percentages, success, and learning; ask why 10–90 feels compelling. Hold the rest of the protocol fixed, show denominators, and separate description from causality.

5.2 Natural frequencies

Mechanism. The screen organizes one case favoring stay and two favoring switch.

Prediction. It lowers the work required to build the sample space.

Teaching readout. Explain three cases without percentages, then translate them. Hold the rest of the protocol fixed, show denominators, and separate description from causality.

5.3 Visual probability transfer

Mechanism. The display places 33 percent on the chosen door and 67 on the unchosen set.

Prediction. It can reduce equiprobability by exposing selection.

Teaching readout. Compare beliefs and action; the figure is an aid, not a neutral condition. Hold the rest of the protocol fixed, show denominators, and separate description from causality.

5.4 Uninformed host

Mechanism. The host opens randomly and can reveal the prize.

Prediction. Conditional on continuation, each closed door has 50 percent.

Teaching readout. Report reveals, eligible rounds, and conditional rates. Hold the rest of the protocol fixed, show denominators, and separate description from causality.

5.5 Biased protocol

Mechanism. When able to choose, the host opens the lower-numbered empty door.

Prediction. Switching keeps its ex-ante advantage while a particular reveal changes likelihoods.

Teaching readout. Apply Bayes and separate commitment from posterior action. Hold the rest of the protocol fixed, show denominators, and separate description from causality.

5.6 Beliefs

Mechanism. Participants state a 0–100 chance that switching wins.

Prediction. The measure partly separates representation and action.

Teaching readout. Show the distribution and mass at 50; avoid individual diagnosis. Hold the rest of the protocol fixed, show denominators, and separate description from causality.



Elección inicial

Elección inicial

Ronda 1 de 10

Seleccione una puerta. Todavía no sabe dónde está el premio.

PUERTA 1 PUERTA 2 PUERTA 3 PUERTA 4 PUERTA 5 PUERTA 6 PUERTA 7

PUERTA 8 PUERTA 9 PUERTA 10

Confirmar puerta inicial

Con tecnología de [oTree](#)

Figure 5.1: Ten-door initial choice.

Instrucciones

Instrucciones

Hay 3 puertas y una contiene un premio de 100 ECU. El presentador sabe dónde está el premio, nunca abre su puerta inicial y siempre abre 1 puerta(s) sin premio. Después le ofrece permanecer o cambiar a la única otra puerta cerrada.

100 ECU



Tres casos igualmente probables

Imagine tres repeticiones: su primera elección acierta aproximadamente una vez y falla aproximadamente dos. Permanecer gana en el primer caso; cambiar gana en los otros dos.

✓ · Permanecer

× · Cambiar

× · Cambiar

Después de cada decisión verá la ubicación del premio y el resultado.

Continuar

Con tecnología de [oTree](#)

Figure 5.2: Natural-frequency representation.

El presentador abre 2

El presentador abre 2

2

La(s) puerta(s) abierta(s) no contiene(n) el premio.

Su puerta inicial Puerta 1 Permanecer	× 2	Otra puerta cerrada Puerta 3 Cambiar
---	-------------------	--

Transferencia de probabilidad

33% → 67%

¿Desea permanecer con su puerta inicial o cambiar a la otra puerta cerrada?

Confirmar decisión

Con tecnología de [oTree](#)

Figure 5.3: Visual transfer at the final choice.



Instrucciones

Instrucciones

Hay tres puertas y una contiene un premio de 100 ECU. El presentador NO sabe dónde está el premio y abre al azar una puerta distinta de su elección. Si revela el premio, la ronda termina; si revela una puerta vacía, usted elige entre permanecer o cambiar.

100 ECU



Después de cada decisión verá la ubicación del premio y el resultado.

Continuar

Con tecnología de [oTree](#)

Figure 5.4: Uninformed-host instructions.

Instructor interpretation laboratory

6.1 Module 1: Selected evidence

Core idea. In this module, the observed action depends on the state and a rule. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can compare informed and uninformed hosts. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine conditional rates and prize reveals. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in conditional rates and prize reveals; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess selected evidence. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors compare informed and uninformed hosts. If no distinct observation follows, the account has not yet been identified.

6.2 Module 2: Equiprobability

Core idea. In this module, two visible options need not share the same probability history. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can move from three to ten doors. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine the mass of beliefs at 50 percent. Show people, eligible decisions, and

exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in the mass of beliefs at 50 percent; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess equiprobability. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors move from three to ten doors. If no distinct observation follows, the account has not yet been identified.

6.3 Module 3: Strategy and realization

Core idea. In this module, a superior rule can lose a particular round. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can compare strategy success over many rounds. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine frequencies with denominators. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in frequencies with denominators; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess strategy and realization. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors compare strategy success over many rounds. If no distinct observation follows, the account has not yet been identified.

6.4 Module 4: Learning

Core idea. In this module, behavior can change with experience without identifying the mechanism. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can contrast immediate and delayed feedback. Interpret the

contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine the path and within-person changes. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in the path and within-person changes; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess learning. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors contrast immediate and delayed feedback. If no distinct observation follows, the account has not yet been identified.

6.5 Module 5: Regret

Core idea. In this module, abandoning a winning choice may feel worse than keeping a loser. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can measure beliefs and actions separately. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine high switching beliefs paired with staying. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in high switching beliefs paired with staying; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess regret. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors measure beliefs and actions separately. If no distinct observation follows, the account has not yet been identified.

6.6 Module 6: Mistrust

Core idea. In this module, the normative solution assumes the declared protocol is credible. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can ask about protocol beliefs. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine responses after credibility is reinforced. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in responses after credibility is reinforced; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess mistrust. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors ask about protocol beliefs. If no distinct observation follows, the account has not yet been identified.

6.7 Module 7: Natural frequencies

Core idea. In this module, counts can make the sample space accessible. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can show one of three and two of three. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine switching and verbal explanation. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in switching and verbal explanation; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess natural frequencies. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every

account to state a distinct pattern expected when instructors show one of three and two of three. If no distinct observation follows, the account has not yet been identified.

6.8 Module 8: Number of doors

Core idea. In this module, amplification changes representation without changing theory. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can contrast three and ten doors. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine initial switching and decision time. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in initial switching and decision time; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess number of doors. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors contrast three and ten doors. If no distinct observation follows, the account has not yet been identified.

6.9 Module 9: Biased rule

Core idea. In this module, likelihoods depend on how the host selects among actions. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can derive posteriors for each reveal. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine choices conditional on the opened door. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in choices conditional on the opened door; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence

would assess biased rule. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors derive posteriors for each reveal. If no distinct observation follows, the account has not yet been identified.

6.10 Module 10: Independent unit

Core idea. In this module, repeated rounds share person, experience, and strategy. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can separate decisions from participants. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine counts of people and decisions. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in counts of people and decisions; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess independent unit. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors separate decisions from participants. If no distinct observation follows, the account has not yet been identified.

6.11 Module 11: Denominators

Core idea. In this module, a rate requires a definition of who could choose. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can use the uninformed host. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine total, eligible, and terminated rounds. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in total, eligible, and terminated rounds; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess denominators. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors use the uninformed host. If no distinct observation follows, the account has not yet been identified.

6.12 Module 12: Sampling variation

Core idea. In this module, a long-run probability does not guarantee a small sample. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can simulate many classrooms. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine dispersion of success rates. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only "switch" does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in dispersion of success rates; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess sampling variation. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors simulate many classrooms. If no distinct observation follows, the account has not yet been identified.

6.13 Module 13: Beliefs

Core idea. In this module, stated probability and action are distinct outcomes. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can elicit before confirmation. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine distribution, mean, and joint choice. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions

are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in distribution, mean, and joint choice; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess beliefs. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors elicit before confirmation. If no distinct observation follows, the account has not yet been identified.

6.14 Module 14: Transfer

Core idea. In this module, understanding should generalize beyond memorized numbers. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can change protocol after teaching baseline. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine correct explanation under the new rule. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person’s decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in correct explanation under the new rule; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess transfer. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors change protocol after teaching baseline. If no distinct observation follows, the account has not yet been identified.

6.15 Module 15: Incentives

Core idea. In this module, rewards may increase attention without assuring comprehension. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can compare hypothetical points and salient consequences. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented.

Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine time, errors, and consistency. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in time, errors, and consistency; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess incentives. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors compare hypothetical points and salient consequences. If no distinct observation follows, the account has not yet been identified.

6.16 Module 16: Communication

Core idea. In this module, discussion transmits reasoning and creates conformity. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can allow it only after the first measure. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine changes and diversity of reasons. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in changes and diversity of reasons; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess communication. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors allow it only after the first measure. If no distinct observation follows, the account has not yet been identified.

6.17 Module 17: Visual representation

Core idea. In this module, an aid changes the cognitive task. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can compare text with probability graphics. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine belief, choice, and explanation. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only "switch" does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in belief, choice, and explanation; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess visual representation. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors compare text with probability graphics. If no distinct observation follows, the account has not yet been identified.

6.18 Module 18: Bayes

Core idea. In this module, a posterior combines prior and likelihood. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can write numerator and denominator before simplifying. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine ability to reconstruct the calculation. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only "switch" does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in ability to reconstruct the calculation; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess bayes. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors write numerator and denominator before simplifying. If no distinct observation follows, the account has not yet been identified.

6.19 Module 19: Economic application

Core idea. In this module, evidence selected by an informed agent is not random. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can transfer to quality disclosure. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine correct identification of the selection rule. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in correct identification of the selection rule; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess economic application. Then change one host rule and require a directional prediction before showing new data.

Common mistake. A result consistent with the core idea does not uniquely prove it. The same behavior can reflect comprehension, learning, regret, mistrust, or an interface cue. Require every account to state a distinct pattern expected when instructors transfer to quality disclosure. If no distinct observation follows, the account has not yet been identified.

6.20 Module 20: Teaching ethics

Core idea. In this module, choices must not become personal labels. State the proposition before viewing results and write what observation would challenge the preferred account. Monty Hall keeps payoffs simple so attention can remain on the information-generating process.

Useful comparison. Instructors can project only aggregates. Interpret the contrast only when instructions, feedback timing, rounds, and population are documented. Cross-class differences motivate hypotheses but do not replace within-session assignment.

Measures. Examine voluntary participation in discussion. Show people, eligible decisions, and exclusions. With repetition, display first and last rounds and remember that one person's decisions are dependent. Describe shape and dispersion before proposing a mechanism.

Closing prompt. Require an explanation containing the host rule, relevant probability, report evidence, and one limitation. Saying only “switch” does not establish understanding. Change one rule and request a new prediction to test transfer.

Discussion case. Imagine two groups of equal size. The first shows a clear pattern in voluntary participation in discussion; the second has a similar mean but a much wider distribution. Ask why the mean is insufficient, which observations belong to the same person, and what evidence would assess teaching ethics. Then change one host rule and require a directional prediction before showing new data.

Common mistake. Aggregate projection protects privacy, not the validity of an interpretation. A high switching rate may reflect understanding, advice, or learning. Ask students to justify their choice using the host rule before claiming transfer.

Preparation, operation, and analysis

7.1 Before class

Define one question and one comparison. Check projector, network, and routes. Enter Demo, verify that only Monty Hall appears, select language and treatment, create the session, open Monitor and Report, and complete one test link. Reserve board space for prediction, protocol, benchmark, and result. Do not improvise parameters after starting. Record date, course, configuration, participants, and extra oral instructions.

7.2 During and after

Read only general rules and do not reveal the solution in diagnostic conditions. The activity has no wait pages; prolonged waiting indicates a problem. Confirm coverage before reveal. Show counts first, then switching, success, and trajectory. Export data, archive incidents, and never project codes. A teaching note separates observation, interpretation, and open question.

7.3 Fifty-, ninety-, and 120-minute plans

In 50 minutes use one decision: five minutes prediction, ten activity, twenty sample-space derivation, and ten report. In 90 minutes compare immediate and delayed feedback and study paths. In 120 minutes combine baseline with ten doors or uninformed host, derive Bayes, and close with an application. Never accumulate variants without linking manipulation, prediction, and measure.

7.4 Rigorous interpretation

A descriptive claim includes a denominator: “62 percent of 80 eligible decisions switched.” Person-level claims recognize repetition. Explanations require evidence. Mean belief can hide polarization; show distribution, median, and mass at 50. Do not call a losing switch a bad decision or a small sample a refutation of the benchmark.

Attention

The report is aggregate, but comments can expose identities in a small class. Never force disclosure and never grade an individual from the result.

7.5 Troubleshooting

If Demo lists other families, verify `GAME_FAMILY=montyhall`. If Rooms does not list four rooms, inspect deployment. If a basic room offers extensions, inspect the prefix filter. If a link reports that the participant does not exist, create a new session. If someone stalls, inspect Monitor before refreshing. If Report remains locked, decisions are pending. An uninformed host revealing the prize is treatment behavior. If doors do not respond, verify JavaScript and one tab per link.

7.6 Economic applications

Monty Hall shows that evidence arrives through mechanisms. In hiring, passing a filter is interpretable only when the filter is understood. In disclosure, an informed firm may select a favorable attribute. In diagnosis, a posterior depends on sensitivity, specificity, and prevalence. In markets, informed removal changes the composition of remaining options. Ask not only what was observed but why it could be observed.

Worked examples and exercises

8.1 Exercise 1: Sample space

Question. List locations after choosing door 1.

Worked solution. Prize at 1 favors staying; prize at 2 or 3 favors switching: one versus two equal states. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.2 Exercise 2: Three hundred trials

Question. How many wins are expected from switching?

Worked solution. $300(2/3) = 200$, with sampling variation around the expectation. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.3 Exercise 3: Ten doors

Question. Compute staying and switching.

Worked solution. The initial choice is right with $1/10$; switching wins with $9/10$. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.4 Exercise 4: Uninformed host

Question. A random empty door opens. What remains?

Worked solution. Conditional on continuation, closed doors are symmetric at $1/2$ each. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.5 Exercise 5: Outcome

Question. Switching lost. Was it wrong?

Worked solution. No. A superior strategy loses when the initial choice was right. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.6 Exercise 6: Learning

Question. Switching rises from 30 to 60 percent. Does this prove Bayes?

Worked solution. It is compatible, but chance, selection, communication, or cues remain. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.7 Exercise 7: Belief and action

Question. A participant reports 70 percent and stays.

Worked solution. Regret, mistrust, or an action error can create the gap. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.8 Exercise 8: Bayes

Question. Door 1 was chosen and 3 opened.

Worked solution. Likelihoods $1/2$ and 1 yield a $2/3$ posterior for the alternative. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.9 Exercise 9: Denominator

Question. Thirty of 100 rounds reveal prize; 35 of 70 survivors switch.

Worked solution. Switching is $35/70 = 50$ percent; also report 30 terminations. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.10 Exercise 10: Independence

Question. Twenty people make ten decisions.

Worked solution. There are 200 decisions and twenty assignment units; cluster by person. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.11 Exercise 11: Treatment

Question. Test natural frequencies.

Worked solution. Randomize, hold rules fixed, measure before outcomes, and predeclare the main outcome. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.12 Exercise 12: Application

Question. Give selected information.

Worked solution. An informed firm reveals its best indicator; interpretation requires the rule. A complete answer names the protocol, denominator, and distinction between ex-ante probability and realization. Ask for an observation that distinguishes this explanation from an alternative.

8.13 Glossary and final checklist

Prior	Belief before observing the host's action.
Likelihood	Probability of the observed action under a prize state.
Posterior	Updated belief combining prior and likelihood.
Selected evidence	Data whose appearance depends on state and rule.
Strategy	Complete rule such as always switch or always stay.
Realization	Particular random outcome.
Natural frequency	Case counts that support a sample-space representation.
Experimental unit	Independent assignment source; here, the person.
Denominator	Eligible set underlying a rate.

Before closing, verify: 24 isolated configurations; four rooms; correct treatment; current links; explicit host protocol; hidden Report; complete coverage; visible denominators; archived export; and one final sentence connecting host rule to inference.

Annotated bibliography

[Selvin \(1975a\)](#) poses the problem and [Selvin \(1975b\)](#) clarifies the host rule. [Granberg and Brown \(1995\)](#) study choice and experience. [Friedman \(1998\)](#) treats the anomaly as institutionally constructed. [Palacios-Huerta \(2003\)](#) studies learning. [Krauss and Wang \(2003\)](#) examine representations. [James et al. \(2018\)](#) study transparent merging.

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