Cloud Fundamentals

Ages 16-17 | Future Pros

Design a secure cloud plan on paper or in a free diagram tool.

How to use this guide

Read each section, complete its four lab steps, then answer the questions in the online course. The online progress bar advances only after four correct answers.

Section 1: Azure concepts

LEARNING GOAL: Azure concepts. Your finished work should demonstrate: A basic cloud service diagram.

EXPLAIN THE CONCEPT: Cloud services provide computing, storage, and networking on demand. Pick a service based on the problem and know who manages each part. Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.

ORIGINAL PROJECT LAB: 1. Sketch a pretend photo-sharing app. 2. Label where its application and files could run. 3. Draw a connection between the two. 4. Explain one benefit and one responsibility of the cloud plan. Finished result: A basic cloud service diagram.

Understand with an example

The idea. Cloud concepts separate compute, storage and networking responsibilities. A service choice should follow workload needs and operational responsibilities rather than a product name alone. This exercise uses generic roles and makes no current product or pricing claim.

Get ready. A fictional study app needs to run a server, retain project files and receive requests.

Worked example 1

Follow the reasoning. Assign server execution to compute, durable files to storage and request connectivity to networking. Explain the responsibility of each; storage capacity alone does not execute the application logic.

Worked example 2: change one thing

Compare the result. Keep storage available but stop compute in the scenario. Files

may remain retained while the application stops responding. Persistence and application availability are distinct properties.

Try one action at a time

1. List workload responsibilities.
2. Map each to a resource role.
3. Trace one request path.
4. Predict failure of one role.

A mistake to notice

Pause and check. Do not infer a specific provider service guarantee from a generic architecture sketch.

Your own small challenge

Predict before trying. Does having a stored backup mean the application is currently serving users?

Check your thinking

No. Recovery data and live serving capacity are different requirements and need different evidence.

Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.

GO DEEPER: Identify an assumption, test a safe alternative, and explain the trade-off. Keep a short before-and-after record that someone else could follow.

SAFETY CHECK: Apply identity security, social-engineering defense, secure coding, cloud controls, incident handling, data protection, and professional ethics. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.

REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.

PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing the goal, your approach, your evidence, and one lesson learned. Expected result: A basic cloud service diagram.

Investigate with pictures and choices

An app moves to a managed cloud service.

Who still needs to review app permissions?

1. The application owner under the shared model
2. Nobody after migration
3. Only the logo designer

Worked reasoning

Answer: The application owner under the shared model. Managed infrastructure does not remove every customer responsibility.

Try a changed example

Write provider-owned and customer-owned tasks for a fictional service.

Picture and meaning matches

Cloud service: Has shared responsibilities

Identity: Controls who may act

Architecture: Connects trust boundaries

Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool.

A helper can operate the controls while you choose.

Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed.

Choose this foundation practice only when it fits the learner goal.

My notes: _____

Hands-on lab

1. Sketch a pretend photo-sharing app.
2. Label where its application and files could run.
3. Draw a connection between the two.
4. Explain one benefit and one responsibility of the cloud plan.

Finished result: A basic cloud service diagram.

Check your understanding

1. Which idea best describes Azure concepts?

A. A design should consider access, data protection, and recovery before it is built.

B. It has no purpose in this project.

C. Identity controls who can access a resource.

D. Cloud services provide computing, storage, and networking on demand.

2. What is the first step in this lab?

A. Sketch a pretend photo-sharing app.

B. Explain one benefit and one responsibility of the cloud plan.

C. Label where its application and files could run.

D. Draw a connection between the two.

3. What should you do after step two?

A. Sketch a pretend photo-sharing app.

B. Draw a connection between the two.

C. Label where its application and files could run.

D. Explain one benefit and one responsibility of the cloud plan.

4. Which result shows that your lab is finished?

A. A skipped lab

B. A blank page with no work

C. A basic cloud service diagram.

D. A copied answer without checking it

Answer review

1. D. Cloud services provide computing, storage, and networking on demand.
2. A. Start with: Sketch a pretend photo-sharing app.
3. B. Step three is: Draw a connection between the two.
4. C. The goal is: A basic cloud service diagram.

Section 2: Identity

LEARNING GOAL: Identity. Your finished work should demonstrate: A least-privilege role table.

EXPLAIN THE CONCEPT: Identity controls who can access a resource. Give a role only the permissions needed for its task. Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.

ORIGINAL PROJECT LAB: 1. List an owner, editor, and viewer for your pretend app. 2. Write what each role must do. 3. Remove any permission that role does not need. 4. Add an extra sign-in step for the owner. Finished result: A least-privilege role table.

Understand with an example

The idea. Identity establishes who is acting; authorization determines what that identity may do. Scope permissions to required actions and resources, then test both permitted and denied paths.

Get ready. A fictional project has a reader role and an editor role. Readers may view; editors may view and update.

Worked example 1

Follow the reasoning. The reader’s update attempt should be denied while viewing remains allowed. The editor’s update should be permitted under the stated table. A role name alone is not evidence of effective access.

Worked example 2: change one thing

Compare the result. Place the reader in another group granting update rights. Effective authorization may now allow the update, so review all relevant assignments rather than only the direct role.

Try one action at a time

1. Write actions per role.
2. Include resource scope.
3. Predict allowed and denied cases.
4. Review indirect assignments.

A mistake to notice

Pause and check. Do not test access changes on real accounts without authorized scope.

Your own small challenge

Predict before trying. Does successful authentication prove a user may delete a project?

Check your thinking

No. Deletion requires an applicable authorization rule; sign-in alone does not establish that right.

Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.

GO DEEPER: Identify an assumption, test a safe alternative, and explain the trade-off. Keep a short before-and-after record that someone else could follow.
SAFETY CHECK: Apply identity security, social-engineering defense, secure coding, cloud controls, incident handling, data protection, and professional ethics. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.
REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.
PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing the goal, your approach, your evidence, and one lesson learned. Expected result: A least-privilege role table.

Investigate with pictures and choices

A reader account can modify all cloud resources.
What should change?
1. Share an administrator password
2. Rely on a friendly account name
3. Grant only the required read scope

Worked reasoning

Answer: Grant only the required read scope. Permissions should fit the intended role and scope.

Try a changed example

Test both an allowed read and a rejected modification.

Picture and meaning matches

Cloud service: Has shared responsibilities
Identity: Controls who may act
Architecture: Connects trust boundaries

Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool.
A helper can operate the controls while you choose.

Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed. Choose this foundation practice only when it fits the learner goal.

My notes: _____

Hands-on lab

1. List an owner, editor, and viewer for your pretend app.
2. Write what each role must do.
3. Remove any permission that role does not need.
4. Add an extra sign-in step for the owner.

Finished result: A least-privilege role table.

Check your understanding

1. Which idea best describes Identity?

A. Cloud services provide computing, storage, and networking on demand.

B. Identity controls who can access a resource.

C. A design should consider access, data protection, and recovery before it is built.

D. It has no purpose in this project.

2. What is the first step in this lab?

A. Write what each role must do.

B. Remove any permission that role does not need.

C. List an owner, editor, and viewer for your pretend app.

D. Add an extra sign-in step for the owner.

3. What should you do after step two?

A. Write what each role must do.

B. Add an extra sign-in step for the owner.

C. List an owner, editor, and viewer for your pretend app.

D. Remove any permission that role does not need.

4. Which result shows that your lab is finished?

A. A least-privilege role table.

B. A copied answer without checking it

C. A skipped lab

D. A blank page with no work

Answer review

1. B. Identity controls who can access a resource.
2. C. Start with: List an owner, editor, and viewer for your pretend app.

3. D. Step three is: Remove any permission that role does not need.

4. A. The goal is: A least-privilege role table.

Section 3: Architecture

LEARNING GOAL: Architecture. Your finished work should demonstrate: A cloud diagram with access and recovery notes.

EXPLAIN THE CONCEPT: A design should consider access, data protection, and recovery before it is built. Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.

ORIGINAL PROJECT LAB: 1. Add a private data area to your diagram. 2. Mark which roles can reach it. 3. Draw where a backup would be kept. 4. Explain what happens if the main service stops. Finished result: A cloud diagram with access and recovery notes.

Understand with an example

The idea. An architecture model explains dependencies and failure boundaries. Redundancy helps only when alternatives do not share the same unresolved point of failure. Label which assumptions the drawing relies on.

Get ready. A fictional app has two servers behind one entry point and one shared database.

Worked example 1

Follow the reasoning. If one server fails and routing can send requests to the other, serving may continue. If the shared database fails, both servers may lose the required data path. Two servers do not remove that dependency.

Worked example 2: change one thing

Compare the result. Add a second server in the same failure zone. This can help a single-server failure but may not help a zone-wide outage. The location of redundancy matters.

Try one action at a time

1. Draw the request path.
2. Mark shared dependencies.
3. Predict one component failure.

4. State recovery and testing assumptions.

A mistake to notice

Pause and check. Do not count boxes as independent resilience without checking shared dependencies.

Your own small challenge

Predict before trying. What evidence would support a failover claim?

Check your thinking

A controlled, authorized test showing the intended workload continues through the alternate path under stated conditions. A diagram alone is insufficient.

Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.

GO DEEPER: Identify an assumption, test a safe alternative, and explain the trade-off. Keep a short before-and-after record that someone else could follow.

SAFETY CHECK: Apply identity security, social-engineering defense, secure coding, cloud controls, incident handling, data protection, and professional ethics. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.

REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.

PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing the goal, your approach, your evidence, and one lesson learned. Expected result: A cloud diagram with access and recovery notes.

Investigate with pictures and choices

A private data store is directly reachable from the public internet.

What should the design review?

1. Whether the icon is a cloud
2. Required paths, identity and network boundaries
3. Only the storage name

Worked reasoning

Answer: Required paths, identity and network boundaries. Network reachability and

identity controls need an explicit design.

Try a changed example

Draw approved client-to-service and service-to-store paths.

Picture and meaning matches

Cloud service: Has shared responsibilities

Identity: Controls who may act

Architecture: Connects trust boundaries

Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool.

A helper can operate the controls while you choose.

Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed.

Choose this foundation practice only when it fits the learner goal.

My notes: _____

Hands-on lab

1. Add a private data area to your diagram.
2. Mark which roles can reach it.
3. Draw where a backup would be kept.
4. Explain what happens if the main service stops.

Finished result: A cloud diagram with access and recovery notes.

Check your understanding

1. Which idea best describes Architecture?

A. Cloud services provide computing, storage, and networking on demand.

B. A design should consider access, data protection, and recovery before it is built.

C. Identity controls who can access a resource.

D. It has no purpose in this project.

2. What is the first step in this lab?

A. Mark which roles can reach it.

B. Draw where a backup would be kept.

C. Add a private data area to your diagram.

D. Explain what happens if the main service stops.

3. What should you do after step two?

A. Mark which roles can reach it.

B. Explain what happens if the main service stops.

C. Add a private data area to your diagram.

D. Draw where a backup would be kept.

4. Which result shows that your lab is finished?

A. A cloud diagram with access and recovery notes.

B. A copied answer without checking it

C. A skipped lab

D. A blank page with no work

Answer review

1. B. A design should consider access, data protection, and recovery before it is built.

2. C. Start with: Add a private data area to your diagram.

3. D. Step three is: Draw where a backup would be kept.

4. A. The goal is: A cloud diagram with access and recovery notes.

Section 4: Guided Project & Worked Examples

COURSE INVESTIGATION: A backup must match the recovery objective

YOUR PRACTICE INPUT: A paper architecture backs up a fictional database nightly at 00:00. It fails at 15:00, and a team wants no more than one hour of data loss.

WHY IT WORKS: Under the stated schedule, the latest backup may miss 15 hours of changes. A restore that opens correctly does not meet a one-hour recovery point objective.

PLAN BEFORE YOU ACT: Draw or write the starting state, the question you need to answer, and the evidence you expect to see. A paper trace is acceptable; label it as a prediction unless you actually run a test.

WORK THE CASE: Draw the failure and backup timeline. Separate the last recoverable timestamp from elapsed restoration time.

COMPARE WITH THE EXPECTED RESULT: The design discusses recovery point and recovery time separately and proposes a test instead of claiming unmeasured recovery.

EXPLAIN YOUR REASONING: Show the connection between the supplied input, each decision, and your result. If a number, label, or observation differs, return to the first differing step rather than changing several things together.

KEEP YOUR EVIDENCE: Save the initial plan, a drawing or sanitized output, and one

explanation of what the result does and does not prove. Use pointing, speech, drawing, typing, or your usual communication method.
LEARNING GOAL: Guided Project & Worked Examples. Your finished work should demonstrate: A completed guided project with documented evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.
EXPLAIN THE CONCEPT: Review the course concepts through two applied examples. Compare authentication, authorization, least privilege, and MFA in a fictional cloud identity scenario. Map public/private components, network boundaries, data, logging, and backup needs in a simple architecture. Guided project: Design a secure cloud environment with identity, least privilege, network segmentation, encryption concepts, logging/monitoring, backup, and recovery. Work with synthetic or fictional information and ask an adult for help when appropriate. Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.
ORIGINAL PROJECT LAB: 1. Read both worked examples and explain the reasoning. 2. Design a secure cloud environment with identity, least privilege, network segmentation, encryption concepts, logging/monitoring, backup, and recovery. 3. Record the steps you completed and the result you observed. 4. Compare your result to the goal and correct one issue. Finished result: A completed guided project with documented evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

Understand with an example

The idea. A cloud plan combines resource roles, permission scope and dependency reasoning. Define the user operation before claiming that the design meets it.
Get ready. Plan a fictional project viewer: browser, app server and project store; readers can view but not edit.

Worked example 1

Follow the reasoning. A permitted view follows the server to the store and returns project data. A reader edit should be denied. If the store is unavailable, use controlled feedback rather than pretend the project is empty.

Worked example 2: change one thing

Compare the result. Add another app server but leave the same store. App-server

capacity changes, while the shared-store dependency remains. Update only the resilience claim supported by that change.

Try one action at a time

1. Trace the normal operation.
2. Check role permissions.
3. Predict store failure behavior.
4. Compare a redundant-server design.

A mistake to notice

Pause and check. Availability claims require the complete critical path, not just the front page.

Your own small challenge

Predict before trying. Why is an empty project list different from a failed store request?

Check your thinking

An empty list can be a successful data result. A failed request leaves the list contents unknown and should not be presented as confirmed empty data.
Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.
GO DEEPER: Identify an assumption, test a safe alternative, and explain the trade-off. Keep a short before-and-after record that someone else could follow.
SAFETY CHECK: Apply identity security, social-engineering defense, secure coding, cloud controls, incident handling, data protection, and professional ethics. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.
REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.
PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing the goal, your approach, your evidence, and one lesson learned. Expected result: A completed guided project with documented evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

Investigate with pictures and choices

A cloud cost estimate excludes outgoing data transfer.

What is the right response?

1. Add or disclose the missing cost assumption
2. Call it a guaranteed total
3. Hide the unit prices

Worked reasoning

Answer: Add or disclose the missing cost assumption. A cost model must state units, workload and omitted categories.

Try a changed example

Change the assumed workload and recalculate the estimate.

Picture and meaning matches

Cloud service: Has shared responsibilities

Identity: Controls who may act

Architecture: Connects trust boundaries

Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool.

A helper can operate the controls while you choose.

Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed.

Choose this foundation practice only when it fits the learner goal.

My notes: _____

Hands-on lab

1. Read both worked examples and explain the reasoning.
2. Design a secure cloud environment with identity, least privilege, network segmentation, encryption concepts, logging/monitoring, backup, and recovery.
3. Record the steps you completed and the result you observed.
4. Compare your result to the goal and correct one issue.

Finished result: A completed guided project with documented evidence: Cloud

architecture diagram, Risk/control matrix, Improved design, Operations checklist.

Check your understanding

1. Which idea best describes Guided Project & Worked Examples?

A. Cloud services provide computing, storage, and networking on demand.

B. Review the course concepts through two applied examples.

C. Identity controls who can access a resource.

D. It has no purpose in this project.

2. What is the first step in this lab?

A. Design a secure cloud environment with identity, least privilege, network segmentation, encryption concepts, logging/monitoring, backup, and recovery.

B. Record the steps you completed and the result you observed.

C. Read both worked examples and explain the reasoning.

D. Compare your result to the goal and correct one issue.

3. What should you do after step two?

A. Design a secure cloud environment with identity, least privilege, network segmentation, encryption concepts, logging/monitoring, backup, and recovery.

B. Compare your result to the goal and correct one issue.

C. Read both worked examples and explain the reasoning.

D. Record the steps you completed and the result you observed.

4. Which result shows that your lab is finished?

A. A completed guided project with documented evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

B. A copied answer without checking it

C. A skipped lab

D. A blank page with no work

Answer review

1. B. Review the course concepts through two applied examples.

2. C. Start with: Read both worked examples and explain the reasoning.

3. D. Step three is: Record the steps you completed and the result you observed.

4. A. The goal is: A completed guided project with documented evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

Section 5: Independent Challenge & Mastery

INDEPENDENT TRANSFER CASE: A backup must match the recovery objective

KEEP THE ORIGINAL BASELINE: A paper architecture backs up a fictional database nightly at 00:00. It fails at 15:00, and a team wants no more than one hour of data loss.

CHANGE ONE CONDITION: A backup every hour reduces the potential gap, but a separate restore-time test is still needed.
YOUR TASK: Draw the failure and backup timeline. Separate the last recoverable timestamp from elapsed restoration time.
PREDICT, THEN CHECK: State which part of your original reasoning should remain true and which part must be recalculated or retested. Keep the original and changed results side by side.
REVIEW CRITERIA: The design discusses recovery point and recovery time separately and proposes a test instead of claiming unmeasured recovery.
MENTOR DISCUSSION: Explain why the changed condition matters. Identify a tempting wrong conclusion, show the observation that would challenge it, and choose one next test. A statement of uncertainty is better than inventing a result.
PORTFOLIO NOTE: Keep your baseline, changed input, prediction, observed or paper-traced result, explanation, and one improvement. These practice prompts do not replace the course's existing quiz or final assessment.
LEARNING GOAL: Independent Challenge & Mastery. Your finished work should demonstrate: An independent demonstration with evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.
EXPLAIN THE CONCEPT: Apply what you learned without copying the guided solution. Independent challenge: Review a deliberately weak architecture, identify at least five risks, prioritize them, and produce an improved diagram. Safety and responsibility: Use architecture/sandbox exercises only; never expose cloud keys, make storage public for convenience, or deploy billable resources without adult/owner approval. Reflect on your work: What did you build or discover? What did you test or change after feedback? What safe or responsible choice did you make? Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.
ORIGINAL PROJECT LAB: 1. Explain the challenge and make a short plan. 2. Review a deliberately weak architecture, identify at least five risks, prioritize them, and produce an improved diagram. 3. Test the result and record evidence of your work. 4. Review the safety scenario and describe one improvement. Finished result: An independent demonstration with evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

Understand with an example

The idea. A cloud portfolio plan should document assumptions, access rules and a testable failure scenario without requiring paid resources or actual sensitive data.
Get ready. Design a fictional study tracker with compute, storage and two user roles.

Worked example 1

Follow the reasoning. One plan allows learners to view their own practice records and an instructor role to update assigned records. Define resource scope explicitly rather than grant every role broad access.

Worked example 2: change one thing

Compare the result. Remove the assignment condition for instructors in the hypothetical table. Access expands to unrelated records, so the revised design no longer follows the original scope.

Try one action at a time

1. Write workload and ownership rules.
2. Draw dependency roles.
3. Predict allowed and denied operations.
4. Explain a failure and recovery test.

A mistake to notice

Pause and check. A planned control should never be reported as a verified deployed protection.

Your own small challenge

Predict before trying. List what is still unverified if only your architecture drawing exists.

Check your thinking

Deployment, effective permissions, persistence, availability and recovery behavior remain unverified until appropriate implementation checks occur.
Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.
GO DEEPER: Identify an assumption, test a safe alternative, and explain the

trade-off. Keep a short before-and-after record that someone else could follow.
SAFETY CHECK: Apply identity security, social-engineering defense, secure coding, cloud controls, incident handling, data protection, and professional ethics. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.
REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.
PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing the goal, your approach, your evidence, and one lesson learned. Expected result: An independent demonstration with evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

Investigate with pictures and choices

Two instances run in one region.
What does that alone fail to prove?
1. That both instances exist
2. That an app can have a name
3. Recovery from loss of the whole region

Worked reasoning

Answer: Recovery from loss of the whole region. Availability within one failure domain is different from disaster recovery.

Try a changed example

Define a failure scenario and the evidence needed for recovery targets.

Picture and meaning matches

Cloud service: Has shared responsibilities
Identity: Controls who may act
Architecture: Connects trust boundaries

Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool.
A helper can operate the controls while you choose.

Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed. Choose this foundation practice only when it fits the learner goal.

My notes: _____

Hands-on lab

1. Explain the challenge and make a short plan.
2. Review a deliberately weak architecture, identify at least five risks, prioritize them, and produce an improved diagram.
3. Test the result and record evidence of your work.
4. Review the safety scenario and describe one improvement.

Finished result: An independent demonstration with evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

Check your understanding

1. Which idea best describes Independent Challenge & Mastery?

A. It has no purpose in this project.

B. Cloud services provide computing, storage, and networking on demand.

C. Apply what you learned without copying the guided solution.

D. Identity controls who can access a resource.

2. What is the first step in this lab?

A. Review the safety scenario and describe one improvement.

B. Review a deliberately weak architecture, identify at least five risks, prioritize them, and produce an improved diagram.

C. Test the result and record evidence of your work.

D. Explain the challenge and make a short plan.

3. What should you do after step two?

A. Test the result and record evidence of your work.

B. Review a deliberately weak architecture, identify at least five risks, prioritize them, and produce an improved diagram.

C. Review the safety scenario and describe one improvement.

D. Explain the challenge and make a short plan.

4. Which result shows that your lab is finished?

A. A blank page with no work

B. An independent demonstration with evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

C. A copied answer without checking it

D. A skipped lab

Answer review

1. C. Apply what you learned without copying the guided solution.
2. D. Start with: Explain the challenge and make a short plan.
3. A. Step three is: Test the result and record evidence of your work.
4. B. The goal is: An independent demonstration with evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

Mastery & safe-use plan

Ages 16-17

Digital safety: Apply identity security, social-engineering defense, secure coding, cloud controls, incident handling, data protection, and professional ethics.

AI literacy: Use AI as an accountable engineering assistant: validate outputs, protect data, document use, test security, and keep humans responsible.

Challenge: Work through a realistic ticket, incident, architecture, data, or application scenario with professional evidence.

Portfolio: Produce a career-ready artifact such as a repository, incident report, architecture diagram, dashboard, automation, or technical brief.

Mastery check: Present the work as if to a mentor or interviewer: problem, approach, evidence, tradeoffs, security, and next improvement.

Project worksheet

My project: Design a secure cloud environment

Who will use or review it? _____

My plan: _____

Checkpoint 1: A basic cloud service diagram.

Checkpoint 2: A least-privilege role table.

Checkpoint 3: A cloud diagram with access and recovery notes.

Checkpoint 4: A completed guided project with documented evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

Checkpoint 5: An independent demonstration with evidence: Cloud architecture diagram, Risk/control matrix, Improved design, Operations checklist.

One thing I tested: _____

One thing I changed after testing: _____

What I learned: _____

Trusted adult or mentor feedback: _____

Family review

Show your finished work to a trusted adult. Explain one thing you learned and one thing you would improve.

Beat IT Kids | For learning at home. Do not put real passwords or private details in practice projects.