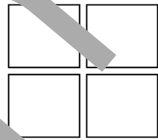# Azure Fundamentals

Instructor Guide

Microsoft

Azure Fundamentals Instructor Guide

Overview

Course Structure

The course is structured to learn by doing, practice the learned skill, and then apply the skill.

- Unit
  - Lesson
    - Learn Tasks
    - Practice Exercises
    - Practice Questions
  - Objective Assessment
  - Create Project

Each unit contains lessons. The lessons are introduced by lesson topics where learners can understand through doing or learning through study materials (eBook, QuickDecks or QuickClips). Each lesson concludes with a Practice Exercise that incorporates the tasks they learned throughout the lesson. Once they have completed the lessons in the unit, learners are assessed through a question-based Objective Assessment and a Create Project.

Delivery

The course is created so it can be customized to meet the needs of the instructor and the learner.

- **Direct Instruction**: Utilize the PowerPoint Presentations to introduce each lesson topic, then have the learners review the study materials and complete the task.

- **Flipped Classroom**: Learners complete XperienceED online lessons outside of class time. Learners utilize the class time to discuss learned tasks, allow learners to teach concepts, expand concepts through learning questions, and work on unit extension or unplugged activities.

- **Learner-Centered Approach:** Use the prescriptive learning model so learners can focus on new skills and skip the skills they already know. Learners can work at their own pace on their own schedule to complete the course. Instructors support learners by utilizing the answer keys to identify struggles and guide learners through the solutions.

Differentiation

- **Study Materials:** Study materials are available in eBook, QuickDecks and QuickClips format. Each study material provides the same concepts and allows the learners to choose the modality that best fits their learning style. The eBook introduces concepts in bite-sized readings. QuickDecks displays materials in a flashcard format. QuickClips provide a video and audio-based clip.

- **Course Progression:** Learners can complete the learn task to demonstrate understanding before reviewing the study materials or they can review one or all the study materials before attempting the learn tasks.

- **Grouping**: Create groups for different learning levels or styles. Customize each group setting to best meet the needs of the learners.

- Provide struggling learners with answer keys to follow step-by-step instructions to complete tasks and exercises.

- Encourage learners to showcase their newly learned skills by creating additional real-world projects, teach others how and why to use new skills, and explore beyond their learning.

Prepare for Delivery

- Begin with the unit overview to understand the structure and flow of the unit, the topics covered, the approximate time to complete and the exam objectives reviewed.

- Review the lesson PowerPoint Presentation to give you an in-depth look at each lesson topic and the comprehensive topic notes included.

- Review the answer keys to familiarize yourself with the tasks learners will complete throughout the lesson.

- Complete the lesson in XperienceED.

Instructor Resources Overview

Instructor Resources File Structure	🗁 Instructor Resources
	🖹 Course Syllabus
	🖹 Course Overview
	🖹 Course Key Terms
	🗁 Unit
	🗁 Unit Assessment Answer Key
	🖹 Create Project
	🖹 Objective Assessment
	🗁 Lesson
	🗁 Answer Keys
	🖹 Lesson Practice Exercises
	🖹 Learn Tasks
	🖹 Lesson Practice Questions
	🗁 Study Guides
	🖹 Study Guide Complete
	🖹 Study Guide Fill-In Explanation
	🖹 Study Guide Fill-In Topic
	🖹 Lesson PowerPoint Presentations
	🗁 Unplugged Activities
	🖹 Unit Overview
	🖹 Unit Learning Plan
	🖹 Unit Key Terms
Unit Assessment Answer Keys	Each unit includes two types of assessments for learners to apply their knowledge.

	• **Create Project** – These are project prompts and sample solution files. Create projects also include "show me" videos in XperienceED for learner reference. You have the option to enable/disable this feature. • **Objective Assessment** – A comprehensive question and answer-based assessment for the unit. Objective Assessments include "show solution" in XperienceED for learner reference. You have the option to enable/disable this feature.
Answer Keys	Documents containing answers, step-by-step instructions, and correct answers for Instructor reference or to offer additional support material for learners. • **Learn Tasks** - Each lesson topic includes an opportunity to apply what they have just learned in-app or by answering questions. Learn Tasks also include "show me" videos and "show solution" in XperienceED for learner reference. • **Lesson Practice Exercises** – End of lesson in-app or scenario-based assessment. Lesson Practice Exercises also include "show me" videos in XperienceED for learner reference. You have the option to enable/disable this feature. • **Lesson Practice Questions** – End of lesson question-based assessment. Lesson Practice Questions also include "show solution" in XperienceED for learner reference. You have the option to enable/disable this feature.
Study Guides	Printable and customizable study guides mapped to lesson topics and exam objectives are provided in three formats. • **Complete**- This version includes the topic and the explanation. • **Fill-In Topic**-Learners can fill the topics as they learn or as a review. • **Fill-In Explanation** – This allows learners to complete the explanation of each lesson topic in their own words and images.
Learning Plan	Customizable unit learning plan outlining the objectives and topics covered, essential questions, learning targets, methods and materials, extension activities, formative and summative assessments, mapping to STEAM, Work Readiness, 5 C's, and Bloom's Taxonomy Levels.
Lesson PowerPoint	A PowerPoint Presentation that complements the XperienceED lesson. Each lesson topic is included in the presentation as well as comprehensive speaker notes.
Unplugged Activities	A variety of activities and necessary resources to get learners off the computers while still reinforcing unit learning objectives.
Unit Key Terms	A comprehensive list of key terms throughout the unit.
Unit Overview	A spreadsheet containing the overview of the flow of the unit that includes lesson topics, certification objectives mapping, and approximate timings for self-paced and instructor-led scenarios.

Microsoft Azure Fundamentals

Enter Dates

Instructor Information

Instructor
add text

Email
add text

Office Location & Hours
add text

General Information

Description

This course introduces learners to the Microsoft Azure cloud platform, which offers more than 200 products and services to customers. This course is also mapped to Certiport's certification exam objectives, a globally accepted, standard-based credential for validating skills.

Learners will begin with an introduction to computer concepts and understand the benefits of using cloud services. They will then progress to looking at the many services and solutions that Azure offers, and move to recognize how Azure handles security issues, governance, policy and compliance requirements. Learners will also have the opportunity to learn how to plan and manage costs when using Microsoft Azure.

Successful completion of the certification exam validates the knowledge and skill sets of individuals seeking employment or advancement in their careers.

Expectations and Goals

Upon completion of this course, learners are expected to complete the Microsoft Azure Fundamentals AZ-900 Exam. Candidates for this exam should have a foundational knowledge of cloud services and how those services are provided with Microsoft Azure. The exam is intended for candidates who are just beginning to work with cloud-based solutions and services or are new to Azure. To learn more about the Microsoft Certified Fundamentals program visit: **Microsoft Certified Fundamentals: Certiport (pearsonvue.com)** Certifications provide significant advantages to professional and job candidates. These include:

- Higher grade point averages for certified high school students
- Higher graduation rates for certified high school students
- Increased post-secondary enrollment
- Reduced dropout rates

Additional information: **The value of certification**

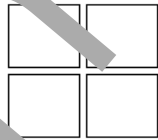## Course Materials

Required materials
- ExperienceFP account
- Computing Device
- Internet Connection

Optional materials
- Headset

Azure Fundamentals

Instructor Guide

Microsoft

Unit	Lesson	Lesson Topic	Self Study Timings in minutes	Instructor-led	Exam OD	OD Description
Unit 2: Core Azure Services						
	Lesson 1: Core Azure Architectural Components					
		Lesson Objectives	0	15		
		Azure Resource Management	15	15	Describe Core Azure Services	Describe the core Azure architectural components
		Azure Resource Manager	15	15	Describe Core Azure Services	Describe the core Azure architectural components
		Azure Regions and Zones	15	15	Describe Core Azure Services	Describe the core Azure architectural components
		Lesson Practice Exercise 1	15	15		
		Lesson Practice Exercise 2	15	15		
		Lesson Practice Questions	20	20		
		Total Time to Complete Lesson	80	110		
	Lesson 2: Azure Compute Services					
		Lesson Objectives	0	15		
		Azure Virtual Machines	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure Containers	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure App Services	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Serverless Computing	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure Virtual Desktop	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Advantages of Using Azure Virtual Desktop	15	15		
		Some Key Features for Azure Desktop	15	15		
		Azure Virtual Desktop Saves Money	15	15		
		Lesson Practice Exercise 1	15	15		
		Lesson Practice Exercise 2	15	15		
		Lesson Practice Exercise 3	15	15		
		Lesson Practice Exercise 4	15	15		
		Lesson Practice Exercise 5	15	15		
		Lesson Practice Exercise 6	15	15		
		Lesson Practice Exercise 7	15	15		
		Lesson Practice Questions	20	20		
		Total Time to Complete Lesson	245	260		
	Lesson 3: Azure Networking Services					
		Lesson Objectives	0	15		
		Virtual Networks	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Virtual Private Network Gateway	15	15	Describe Core Azure Services	Describe core resources available in Azure
		ExpressRoute	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure Firewall	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Lesson Practice Exercise 1	15	15		
		Lesson Practice Exercise 2	15	15		
		Lesson Practice Questions	20	20		
		Total Time to Complete Lesson	110	125		
	Lesson 4: Azure Storage Services					
		Lesson Objectives	0	15		
		Azure Container (Blob) Storage	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure Disk Storage	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure File Storage	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure Storage Tiers	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Lesson Practice Exercise	15	15		
		Lesson Practice Questions	20	20		
		Total Time to Complete Lesson	95	110		
	Lesson 5: Azure Database and Analytics Services					
		Lesson Objectives	0	15		
		Relation and Non-Relational Databases	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure Cosmos DB	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure SQL Database Services	15	15	Describe Core Azure Services	Describe core resources available in Azure
		Azure Database for MySQL	15		Describe Core Azure Services	Describe core resources available in Azure
		Azure Database for PostgreSQL	15		Describe Core Azure Services	Describe core resources available in Azure
		Azure Big Data and Analytics			Describe Core Azure Services	Describe core resources available in Azure
		Azure Marketplace			Describe Core Azure Services	Describe core resources available in Azure
		Lesson Practice Exercise		15		
		Lesson Practice Questions		20		
		Total Time to Complete Lesson		120		
Create Project				40		
Objective Assessment			40			
Total Time to Complete Unit			tes	610	685	
				10.16666667	11.42	

Learning Plan

Unit 2: Core Azure Services

Instructor:	Class:	Duration: 6 – 8 Hours

Unit Objectives:
In this unit, you will be introduced to the Core Architectural components and the core services available in Azure. Upon successful completion of this unit, you should be able to understand the following:

- Core Azure Architectural Components
- Azure Compute Services
- Azure Networking Services
- Azure Storage Services
- Azure Database and Analytics Services

Essential Questions:
1. What are the Core Azure Architectural Components?
2. What are the Azure core services?

Learning Targets:
I will understand Azure Architectural Components.
So I can begin to learn how they work in Azure.
I know I succeeded when I understand how to configure and utilize the services.

Methods and Materials:	Formative Assessments	Summative Assessments:
- Lectures - Reading - Videos - Hand-on activities - Creating - Analyzing - Discussing - Teaching	- Learn Tasks - Practice Questions - Practice Exercises	- Objective Assessment - Create Project

STEAM	Work Readiness	5 C's	Blooms Level
☒Science ☒Technology ☒Engineering ☐Art ☐Math	☐Communication ☒Problem-solving ☒Teamwork ☒Work ethic ☒Empathy ☒Conflict resolution ☒Active listening ☒Time management ☒Adaptability ☒Reading ☒Mathematics	☒Critical Thinking ☒Creativity ☒Communication ☒Collaboration ☒Citizenship	☒Remembering ☒Understanding ☒Applying ☒Analyzing ☒Evaluating ☒Creating

Learning Activities

Lesson	Time Allowed	Content
Core Azure Architectural Components	45 minutes	• Azure Resource Management • Azure Resource Manager • Azure Regions and Zones
Azure Compute Services	55 minutes	• Azure Virtual Machines • Azure Containers • Azure App Services • Serverless Computing • Azure Virtual Desktop
Azure Networking Services	50 minutes	• Virtual Networks • Virtual Private Network Gateway • ExpressRoute • Azure Firewall
Azure Storage Services	50 minutes	• Azure Container (Blob) Storage • Azure Disk Storage • Azure File Storage • Azure Storage Tiers
Azure Database and Analytics Services	65 minutes	• Relation and Non-Relational Databases • Azure Cosmos DB • Azure SQL Database Services • Azure Database for MySQL • Azure Database for PostgreSQL • Azure Big Data and Analytics • Azure Marketplace

Extension Activities

1. Add additional information to the course portfolio. Portfolios should include evidence of work, reflect on learned skills and how you can incorporate the skills in a current or future project. This is an ongoing extension activity. Continue to add to the portfolio throughout the course.
2. Select one topic learned throughout the unit then create an instructional video, tutorial, lecture, or hands on activity to teach others about the skill.
3. Choose one of the core Azure services and create an infographic depicting the structure and/or use of the service.
4. Research active listening and communication. With a partner or in a small group create a podcast or video demonstrating active listening and communication.

Azure Fundamentals Unit 2 Key Terms

Term	Definition
Resource	An item available through the Azure platform that you can create/configure an instance of.
Resource Group	Is a logical grouping of resources. You may group your web apps, database, and storage account in one resource group.
Subscriptions	Enable you to control your spending. Subscriptions group the resource groups and the user accounts that created them. They enable you to set quotas for the consumption of the resources within these resource groups.
Management Groups	Groups subscriptions.
Azure Resource Manager (ARM)	A management layer providing deployment and management service for Azure. Azure Resource Manger allows you to manage your resources, including creating, updating and deleting resources on Azure.
Regions	The geographical locations across the continents where Microsoft has at least one datacenter. In most of the regions, there are many datacenters, and they are connected with high-speed networks called low-latency networks.
Availability Zones	Groups of datacenters within a region. Each availability zone is physically separated from the rest. It has a separate physical location that can sustain itself independently if any of the other availability zone goes down for any reason.
Region Pairs	Regions are grouped into pairs within the same geography e.g., in US, Europe or Asia.
Azure Virtual Machines	Enables you to run multiple operating systems on a physical server. Microsoft Azure platform supports operating systems such as Windows and Linux.
Azure Virtual Machine Scale Sets	Are a feature in Azure that enables you to create identical virtual machines of your existing virtual machine once the demand on your virtual machine increases more than it could support. This helps auto scale your business immediately.
Azure Containers	A lightweight environment that allows the execution of applications. Like virtual machines they enable you to run multiple environments on a single physical server. Unlike virtual machines, you do not manage the OS of a container.
Azure Container Instance (ACI)	Enables you to run single instance. It is a Platform as a Service (PaaS) offering.
Kubernetes Service (AKS)	Enables you to run a cluster, which is a large number of servers.
Azure App Services	Enable you to build, test, deploy and host your applications without the need to manage infrastructure.
Azure Functions	An example of Serverless computing. There is no need to maintain the infrastructure. Your main task is to write your code.
Azure Logic Apps	Provide serverless workflows which automate business scenarios. You use a graphical user interface (GUI) to define the workflow actions and steps.

Unit 2: Unplugged Activities Instructor Guide

Instructions

Below are a variety of offline activities to choose from to support learning in Unit 2. Choose activities to enhance learning in the classroom.

Activity 1: Word Search

Distribute pages 2-5 to the learners.

With Words - Use this word search to reinforce the key terms in Unit 2. An answer key is provided.

With Clues - Use this word search to challenge learners to find key terms in Unit 2 using clues. An answer key is provided.

Activity 2: Crossword Puzzle

Distribute pages 2-3 to the learners.

Have learners solve the crossword puzzle by reading clues and filling in the answer with key terms from Unit 2.

An answer key is provided.

Activity 3: Azure Core Services Game

Provide learners with the list of terms by writing them on the board, projecting them or the printed list. Distribute printed game cards and ask learners to select words from the list and fill their grid with the words.

You will then select from the services randomly and use their description, and learners must guess the service and then cross out any words in their game card. Continue with describing the services until one learner completes their grid.

Activity 4: Forbidden Words Game

Distribute the cards from pages 2-4. Next, divide the learners into two groups. The rules of the game are:

- Each group will take turns to try and win a point for their group
- When it is their turn, a learner from the group will take a card from the cards below and try to describe the service to their group without having to use any of the words listed on the card
- The group loses their point if the learner uses any of the listed words
- A learner from the other group can view the listed words to make sure the learner does not use them
- Have a timer for each turn around 5 minutes
- The group wins if they guessed the right services within the 5 mins and get a point added to their score
- At the end of the activity, the group with the highest score wins

1
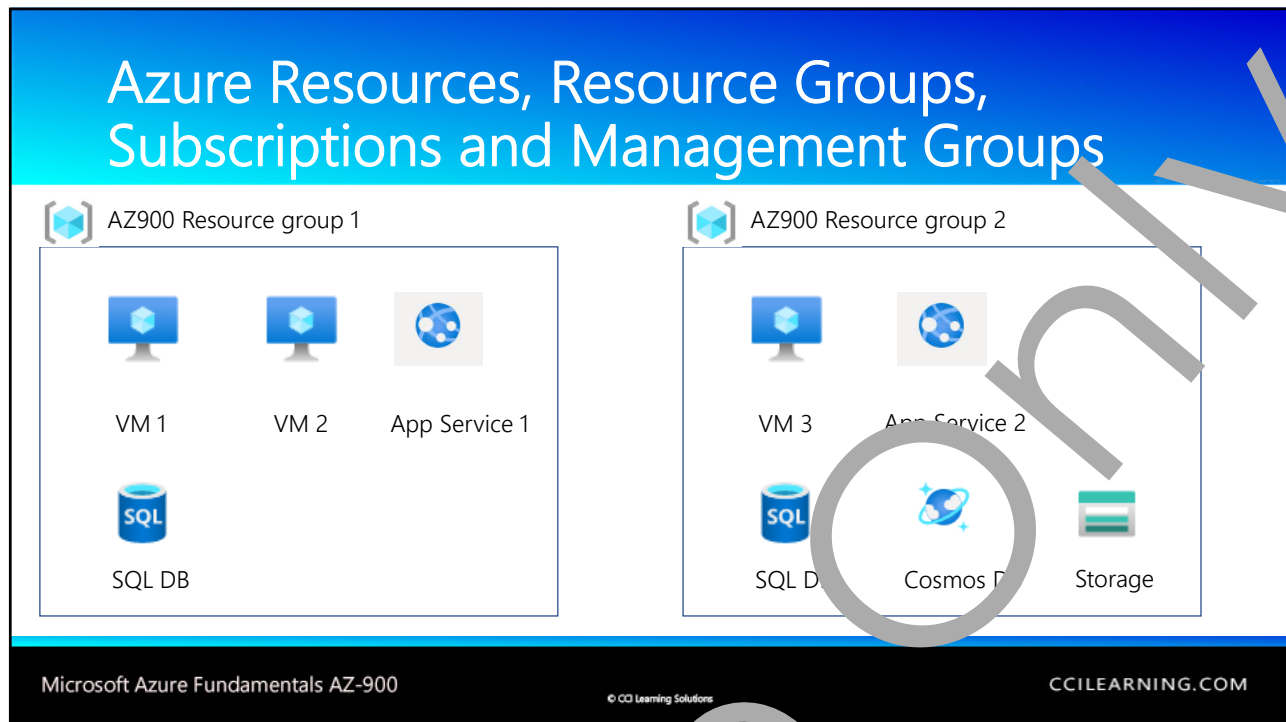

Lesson 1: Core Azure Architectural Components

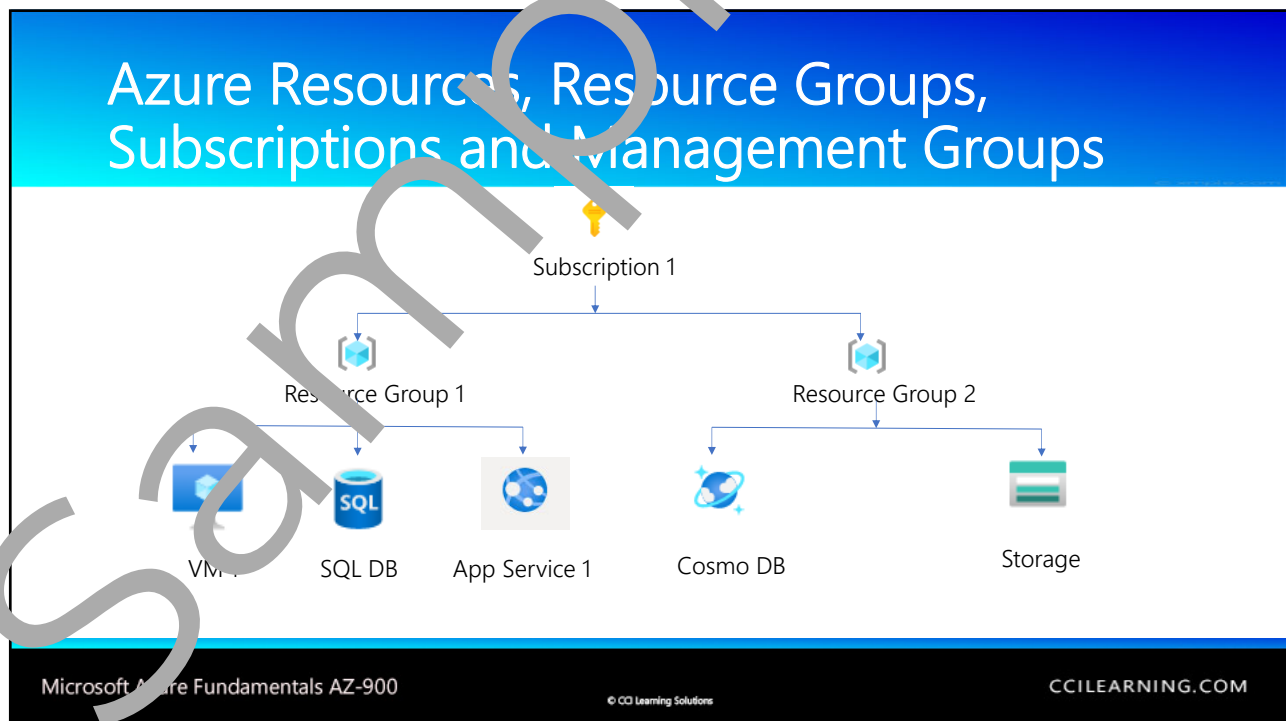Unit 2: Core Azure Services

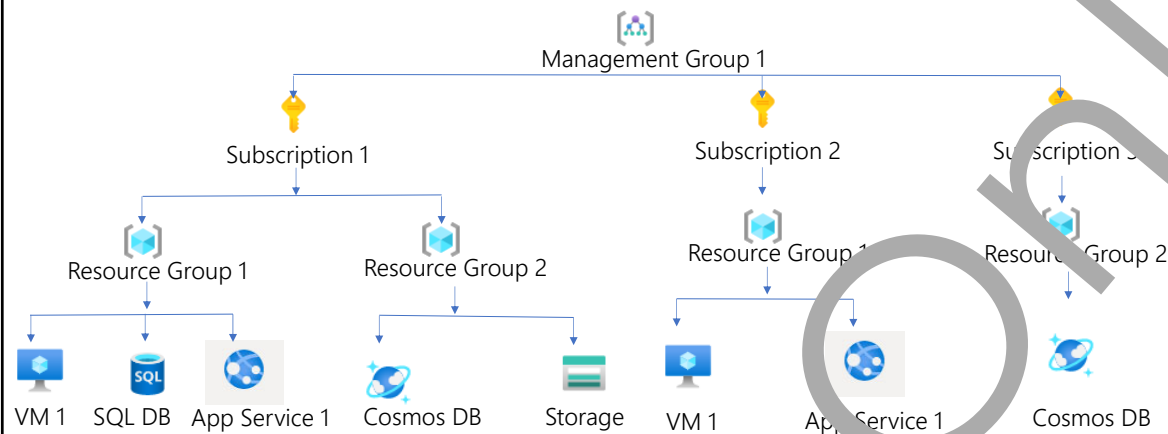Microsoft Azure Fundamentals AZ-900   © CCI Learning Solutions   CCILEARNING.COM

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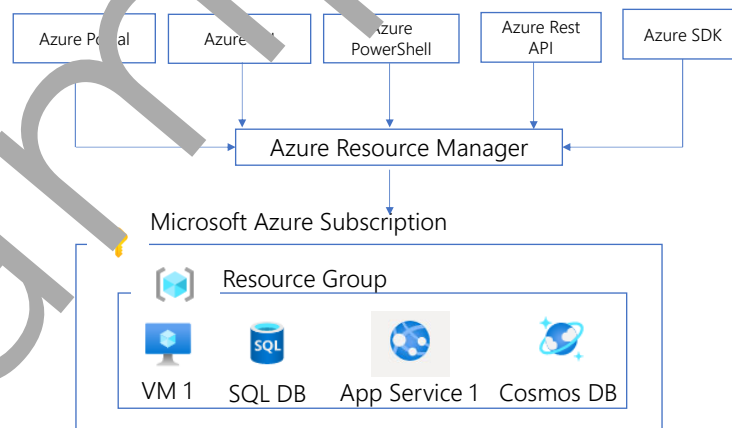## Azure Resources, Resource Groups, Subscriptions and Management Groups

AZ900 Resource group 1

| VM 1 | VM 2 | App Service 1 |

SQL DB

AZ900 Resource group 2

VM 3   App Service 2

SQL DB   Cosmos DB   Storage

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Azure Resources, Resource Groups, Subscriptions and Management Groups

Subscription 1

Resource Group 1   Resource Group 2

VM 1   SQL DB   App Service 1   Cosmo DB   Storage

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Azure Resources, Resource Groups, Subscriptions and Management Groups

Management Group 1

Subscription 1   Subscription 2   Subscription 3

Resource Group 1   Resource Group 2   Resource Group 1   Resource Group 2

VM 1   SQL DB   App Service 1   Cosmos DB   Storage   VM 1   App Service 1   Cosmos DB

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Azure Resource Manager (ARM)

| Azure Portal | Azure CLI | Azure PowerShell | Azure Rest API | Azure SDK |

Azure Resource Manager

Microsoft Azure Subscription

Resource Group

VM 1   SQL DB   App Service 1   Cosmos DB
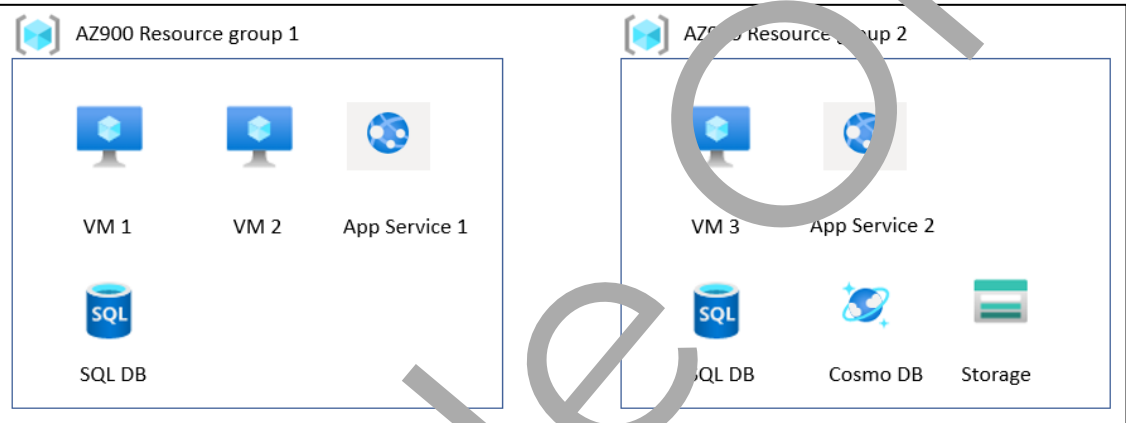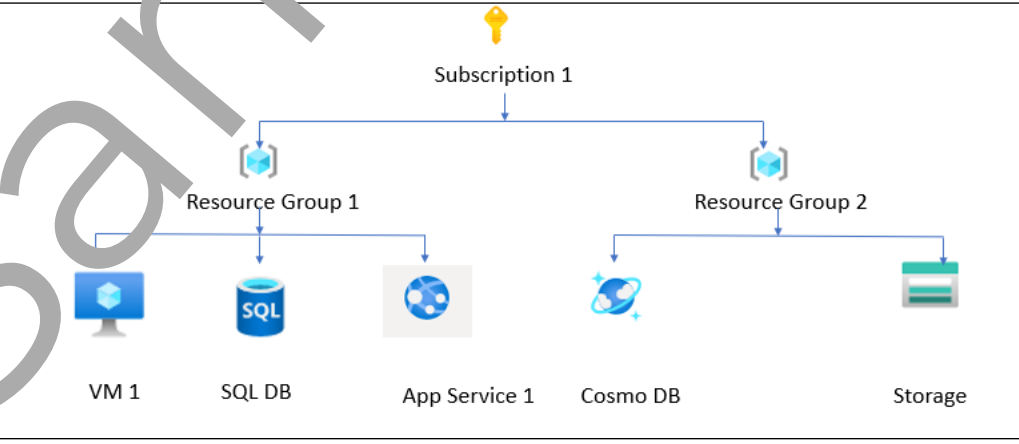
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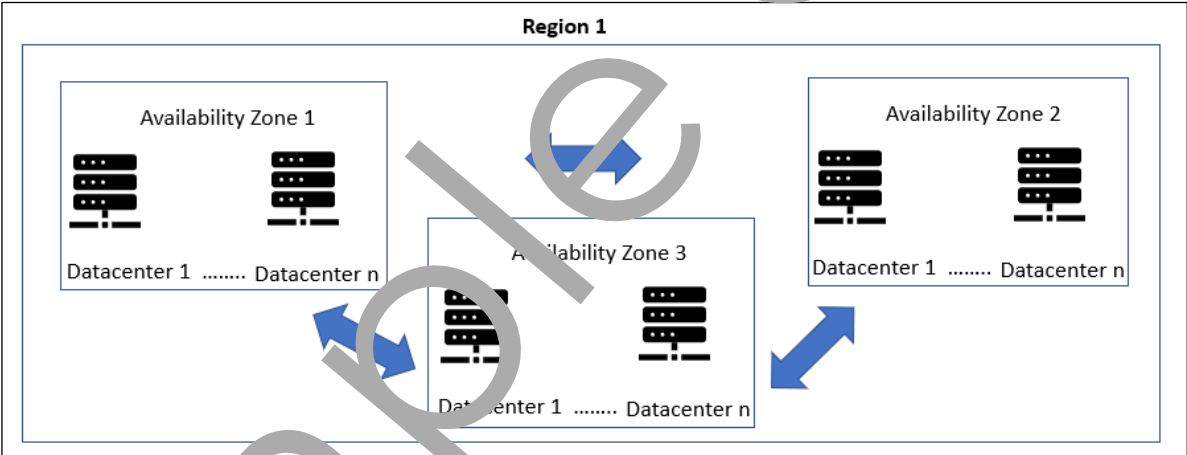
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3

Unit 2 Lesson 1 Study Guide Complete
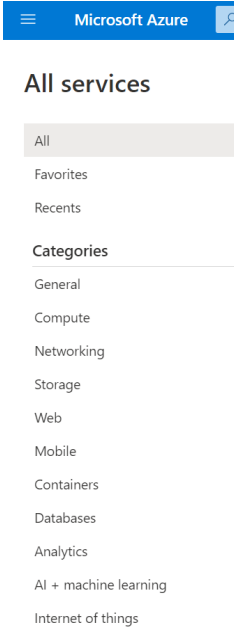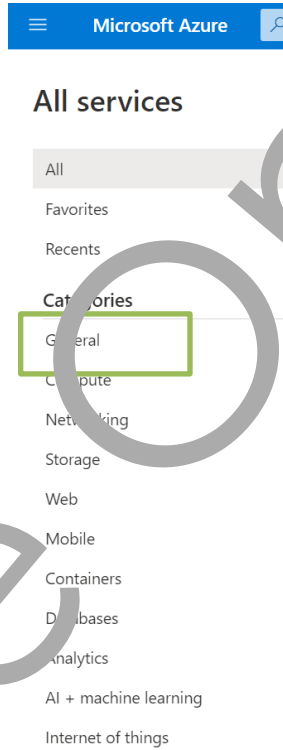
Topic	Explanation
Azure, Resource Management	A **resource** is an item available through the Azure platform that you can create/configure an instance of. For example, a virtual machine (VM) is an available Compute item in Azure. You use this available item to create and configure a VM to host your web application.

A **resource group** is a logical grouping of resources. You may group your web apps, database, and storage account in one resource group. Grouping resources makes them easier to manage. A resource must be part of a resource group. Once you delete a resource group all the resources within this resource group will be deleted as well.

The following figure illustrates how Resource groups encapsulate resources as logical containers.

Figure 1-1: Resource groups

The consumption model in Azure cloud is a pay-as-you-go model. The Azure resources you create consume Azure services as you use them, which translates into money. You want to set quotas for your resources, so you do not end up paying money beyond your budget. You have a fixed budget for your project, and you want your spending to be within the limits of your budget. Azure introduces **Subscriptions** to enable you to control your spending. Subscriptions group the resource groups and the user accounts that created them. They enable you to set quotas for the consumption of the resources within these resource groups.

The following figure illustrates the relationship between subscriptions, resource groups and resources.

 |

Topic	Explanation
	- US DoD Central, US Gov Virginia, US Gov Iowa and more: Is reserved for the US government - China East, China North, and more: They are managed by 21Vianet Some of the Azure infrastructures configured to work in the US regions may need to be refactored to work under regions in China. **Note**: Some Azure services are not tied to a specific region. There is no need to select a region for such as Azure Active Directory, Azure Traffic Manager and Microsoft Azure DNs. Some services and features are available only in certain regions. A single region is composed of multiple datacenters. Within most of the regions, these datacenters are grouped into **Availability zones**. Each availability zone is physically separated from the rest. It has a separate physical location that can sustain itself independently if any of the other availability zones goes down for any reason. For example, each availability zone has its own networking, power, cooling, etc. At a minimum, there are three availability zones in a region. They are connected by super-fast network connections. Some of the regions do not have availability zones though. The following figure illustrates the relationship between a Region and the availability zones within. *Figure 1-6: Availability zones* Using availability zones within your applications empowers your applications with high availability. In case of an emergency and one of the availability zones goes offline, your application will be available to your users by the Azure resources provided by second availability zones. Duplicating your resources across availability zones implies duplicating your cost. This is something to keep in mind when architecting your applications. Regions are grouped into pairs within the same geography e.g., in US, Europe or Asia. They are called **Region Pairs**. The paired regions must be at least 300 miles away, in case a natural disaster happens to one of the regions the other one works as a backup for the impacted region. Planned updates inside a region pair happen in one of the regions first then they are rolled to the second region. This allows for a backup just in case one of the regions is impacted by the updates. The following figure illustrates the relationship between region pairs in the same geography.

Unit 2 Lesson 1 Learn Tasks

Task Level	Objective Domain	Objective Description	Lesson Topic	Assessment Type	Assessment Details	Answer Key	File Name
2	Describe Core Azure Services	Describe the core Azure architectural components	Azure Resource Management	Drag and Drop	Review the following terms and descriptions and match the terms to the correct description. • Subscription • Management groups • Resource group • Resource A *_* is an item available through the Azure platform that you can create/configure an instance of. A *_* is a logical grouping of resources. *_* to enable you to control your spending and they group the resource groups and the user accounts that created them. *_* where you can manage multiple subscriptions.	A *resource* (correct) is an item available through the Azure platform that you can create/configure an instance of. A *resource group* (correct) is a logical grouping of resources. *Subscriptions* (correct) to enable you to control your spending and they group the resource groups and the user accounts that created them. *Management groups* (correct) where you can manage multiple subscriptions.	
2	Describe Core Azure Services	Describe the core Azure architecture components	Azure Resource Manager	Multiple Choice Question	A management layer providing deployment and management service for Azure. • Subscriptions. • Azure Resource Manager (ARM) • Management groups • Resource Group • Resource	• Subscriptions. • **Azure Resource Manager (ARM) (correct)** • Management groups • Resource Group • Resource	

Unit 2 Lesson 1 Practice Exercises

Level	Exercise Number	Assessment Details	Input	Answer Key	File Name
2	1	Watch the following video "U2L1_PracticeExercise.mp4", then answer the following question. • To create a Resource Group, which Category would you select?	N/A		U2L1_ ... ic eExercise.m...
2	2	Drag the icon to t... rect servic... M... nage...ent Groups S...ptions ...Resource Groups	N/A	<table><tr><th>Icon</th><th>Service</th></tr><tr><td>icon</td><td>Management Groups (correct)</td></tr><tr><td>icon</td><td>Subscriptions (correct)</td></tr><tr><td>icon</td><td>Resource Groups (correct)</td></tr></table>	

Unit 2 Lesson 1 Practice Questions

Assessment Type	Assessment Details	Answer Key
Multiple Choice	What is an item available through the Azure platform that you can create/configure an instance of? • Resource group • Subscriptions • Resource • Containers	• Resource group • Subscriptions • **Resource (correct)** • Containers
True/False	When you delete a resource group, the resources within the resource group are deleted.	**True (correct)** False
True/False	Once you create a resource it must be part of a resource group.	**True (correct)** False
True/False	Multiple subscriptions can be part of the same management group.	**True (correct)** False
True/False	A Subscription can have multiple parents.	True **False (correct)**
True/False	Management groups can belong to multiple parents.	True **False (correct)**
True/False	Azure resource manager helps in the process of creating, configuring, and deleting resources.	**True (correct)** False
Multiple Choice	Each of the data centers have separate resources, e.g. networking, power, etc. What are at multiple data centers? • Regions • Region pairs • Availability Zones • Datacenters	• Regions • Region pairs • **Availability Zones (correct)** • Datacenters
True/False	Microsoft cloud services in China is run by 21Vianet.	**True (correct)** False
True/False	Regions can be restricted to government use.	**True (correct)** False