



Small Office Network

Infrastructure & Cybersecurity Track
CCNA (GIZ1_ISS2_M1d)



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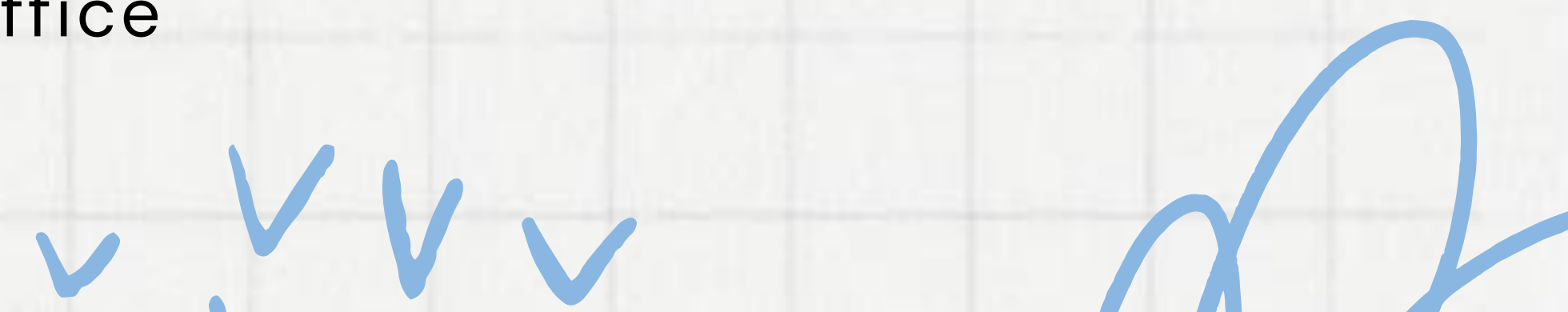
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Introduction

Designing a small office network involves creating a reliable and efficient system that connects various devices within the office to facilitate communication and resource access.

A well-designed network can improve productivity, enhance collaboration, and streamline operations within the office environment.






Introduction

Key considerations in small office network design include selecting the appropriate networking devices (like routers, and switches) ensuring and planning for scalability to accommodate future growth.

By carefully planning and implementing a small office network design, businesses can establish a robust infrastructure that supports their daily operations and enables seamless connectivity among employees, devices, and resources.



Project Process

01

Planning and Design
(users, devices)

02

Configuration of Basic Devices
(switches, routers)

03

Advanced Configuration and Testing
(inter-VLAN, verify connectivity)

04

Documentation and Presentation

**3 Access Switches
(2960-24TT)
2 Uplink Interfaces
24 Ports**

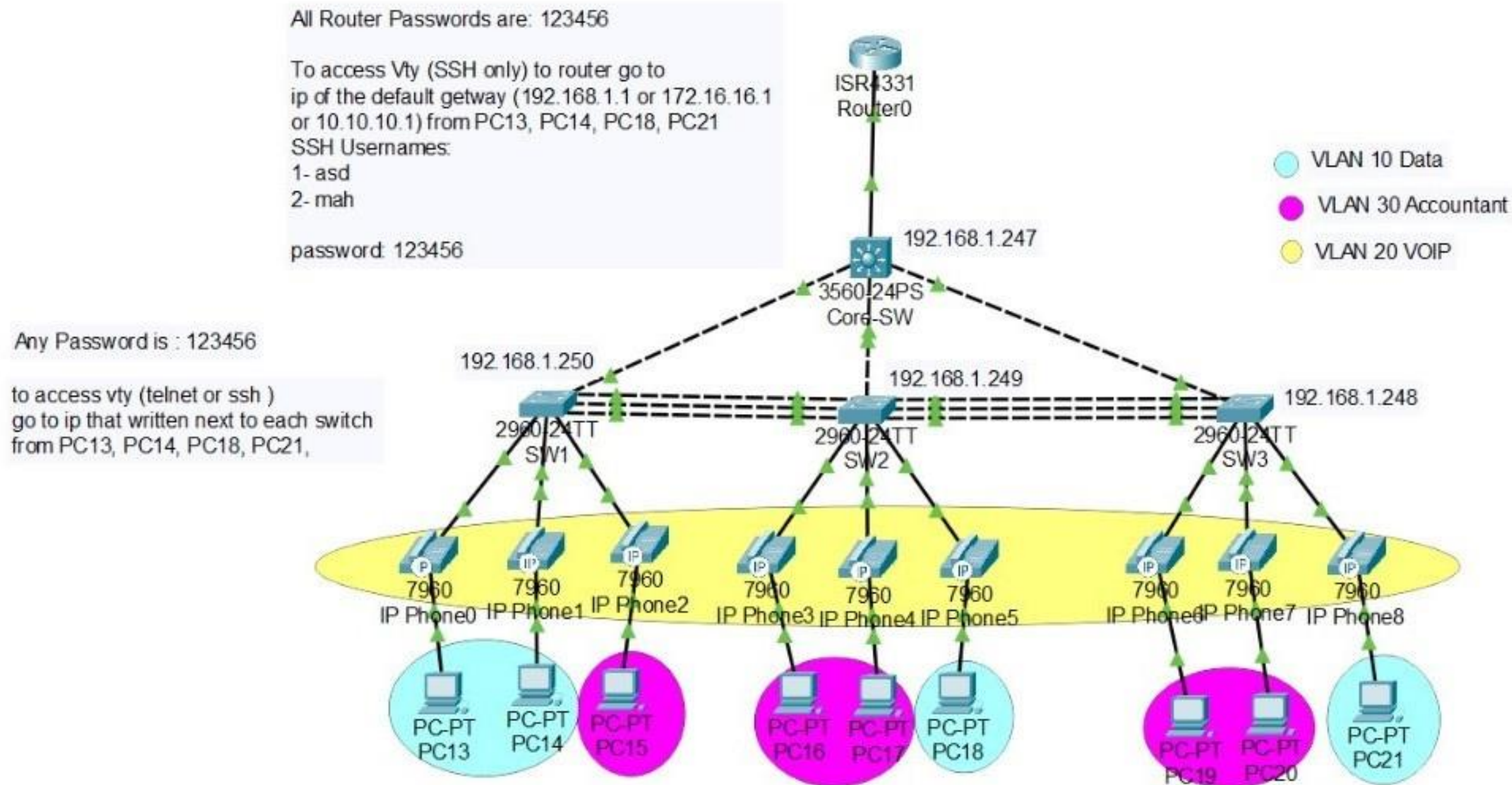
**1 Core Switch
(3560-24PS)
24 Ports
2 SFP-based GE**

Network Design

**1 Router
(ISR 4331)
3 On board WAN**

**9 Telephone IP
9 PC**

Network Design





VLANs

Virtual Local Area Network. It is a method of logically segmenting a physical network into multiple distinct broadcast domains, where devices within the same VLAN can communicate with each other as if they are on the same network, regardless of their physical location.






VLANs

Key points about VLANs:

- Segmentation
- Security
- Broadcast Control
- Flexibility
- scalability
- Inter-VLAN Routing

VLANs provide a powerful tool for network administrators to optimize network performance, and enhance security.






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Spanning Tree Protocol (STP)

- **Definition:** A protocol that prevents network loops by disabling redundant links in a network topology.

- **Benefits:**
 - Prevents network loops
 - Improves network stability
 - Provides redundancy

Ether Channel Group (Port Aggregation Protocol – PAgP)

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Benefits:

- Prevents network loops
- Improves network stability
- Provides redundancy

Telephone Over IP

Telephone over IP, also known as VoIP (Voice over Internet Protocol), is a technology that allows voice communication and multimedia sessions to be transmitted over the internet rather than traditional telephone lines

4 PC - VLAN No. 10

5 PC - VLAN No. 30

VLANs

9 IP Phone - VLAN No. 20



VLANS

All Router Passwords are: 123456

To access Vty (SSH only) to router go to
ip of the default gateway (192.168.1.1 or 172.16.16.1
or 10.10.10.1) from PC13, PC14, PC18, PC21

SSH Usernames:

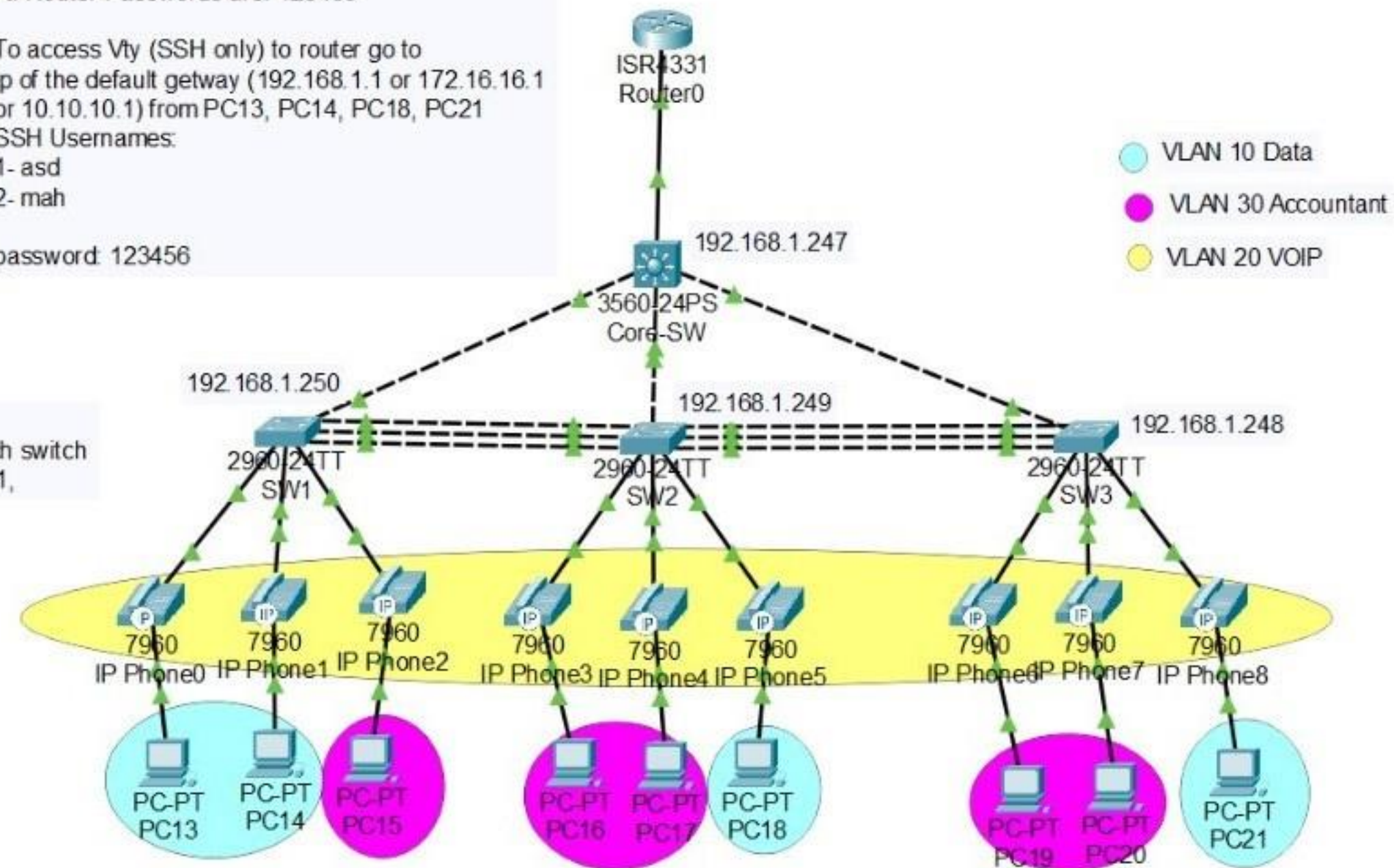
1- asd

2- mah

password: 123456

Any Password is : 123456

to access vty (telnet or ssh)
go to ip that written next to each switch
from PC13, PC14, PC18, PC21,



Access & Core Switches

Access switches are located at the network's edge and connect end-user devices such as computers, printers, IP phones, and access points to the network.


Core switches are positioned at the core or backbone of a network and are responsible for high-speed data switching within the network.



Switches & Router

Routers are networking devices that connect multiple networks and route network traffic between them. They operate at the OSI model's network layer (Layer 3).

Switches are networking devices that connect devices within the same network and facilitate communication within that network. They operate at the OSI model's data link layer (Layer 2).



The background is a light gray grid. It is decorated with various hand-drawn blue doodles. In the top left, there are several overlapping circles and loops. In the top center, there is a scribbled circle. In the top right, there are concentric circles and a star-like shape. On the right side, there are horizontal lines and a circle. In the bottom left, there are concentric circles and a scribbled shape. In the bottom center, there is a wavy line and a series of small 'v' marks. In the bottom right, there is a large, loose loop.

Any Questions

The background is a light blue grid. It is decorated with various hand-drawn blue doodles. In the top left, there are several overlapping circles and loops. In the top center, there is a thick, scribbled blue circle. In the top right, there are more overlapping circles and a star-like shape. On the right side, there are several horizontal lines and a large, thick scribble. In the bottom left, there are concentric arcs and a scribbled circle. In the bottom center, there is a wavy line and a series of small 'v' shapes. In the bottom right, there are more loops and a large, thick scribble.

Thank you