

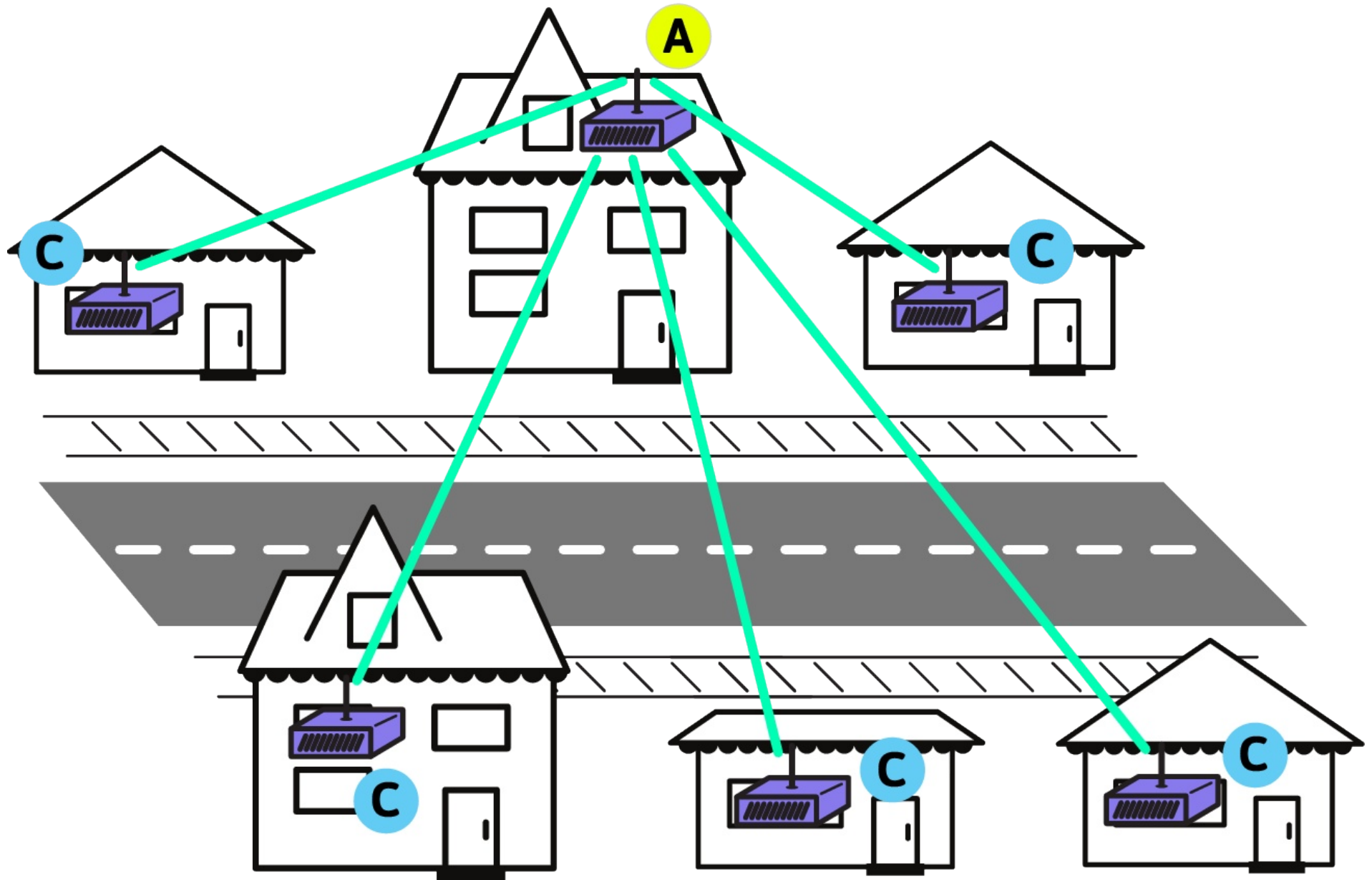
Types of Wireless Networks

Network worksheet solutions



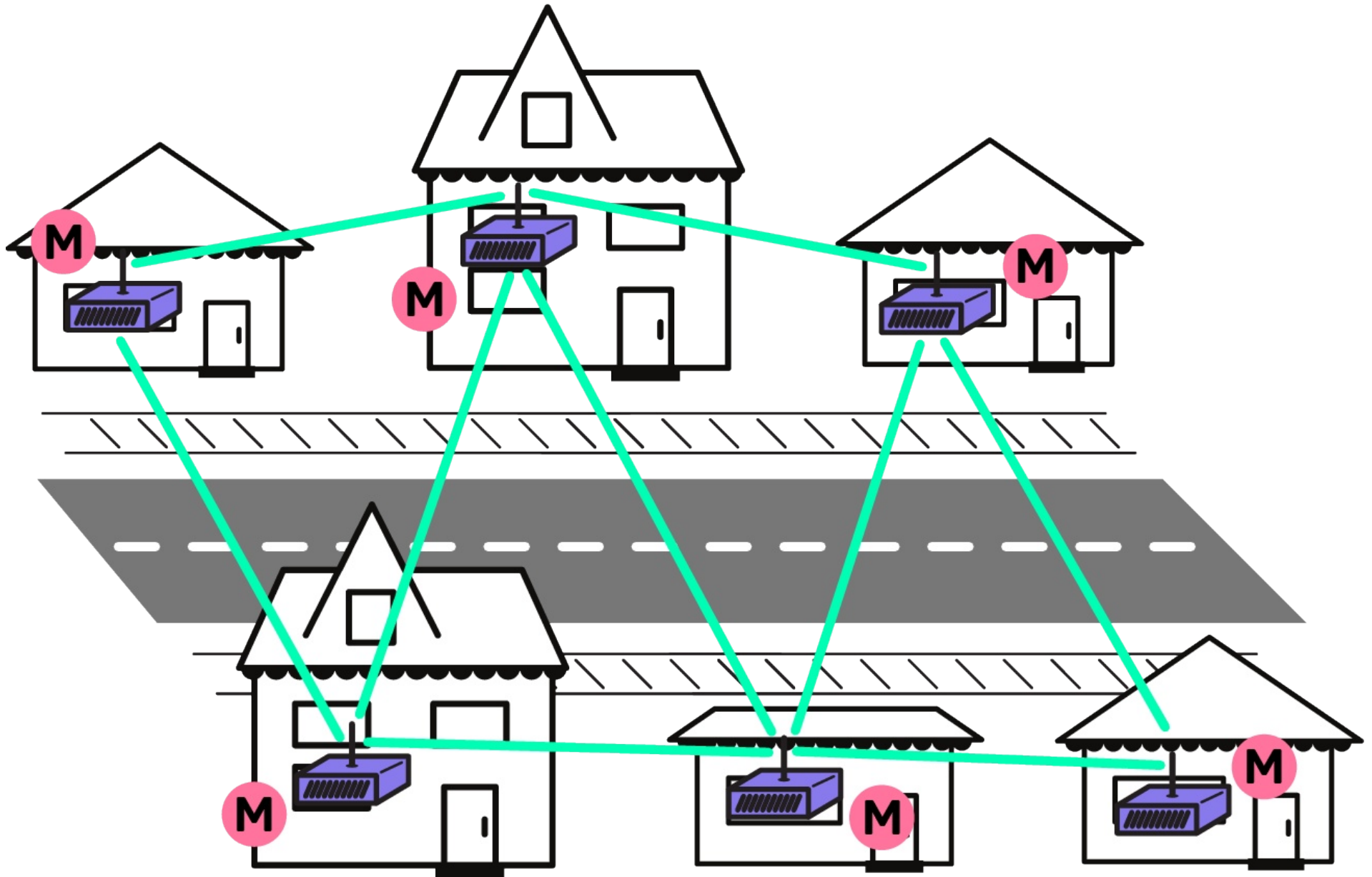
Worksheet 1: Access Point Example

This solution puts a router on the roof of the taller home to provide an **Access Point (AP)**. The other nearby routers are placed in windows, configured as **Clients**, and connect together through the **AP**.



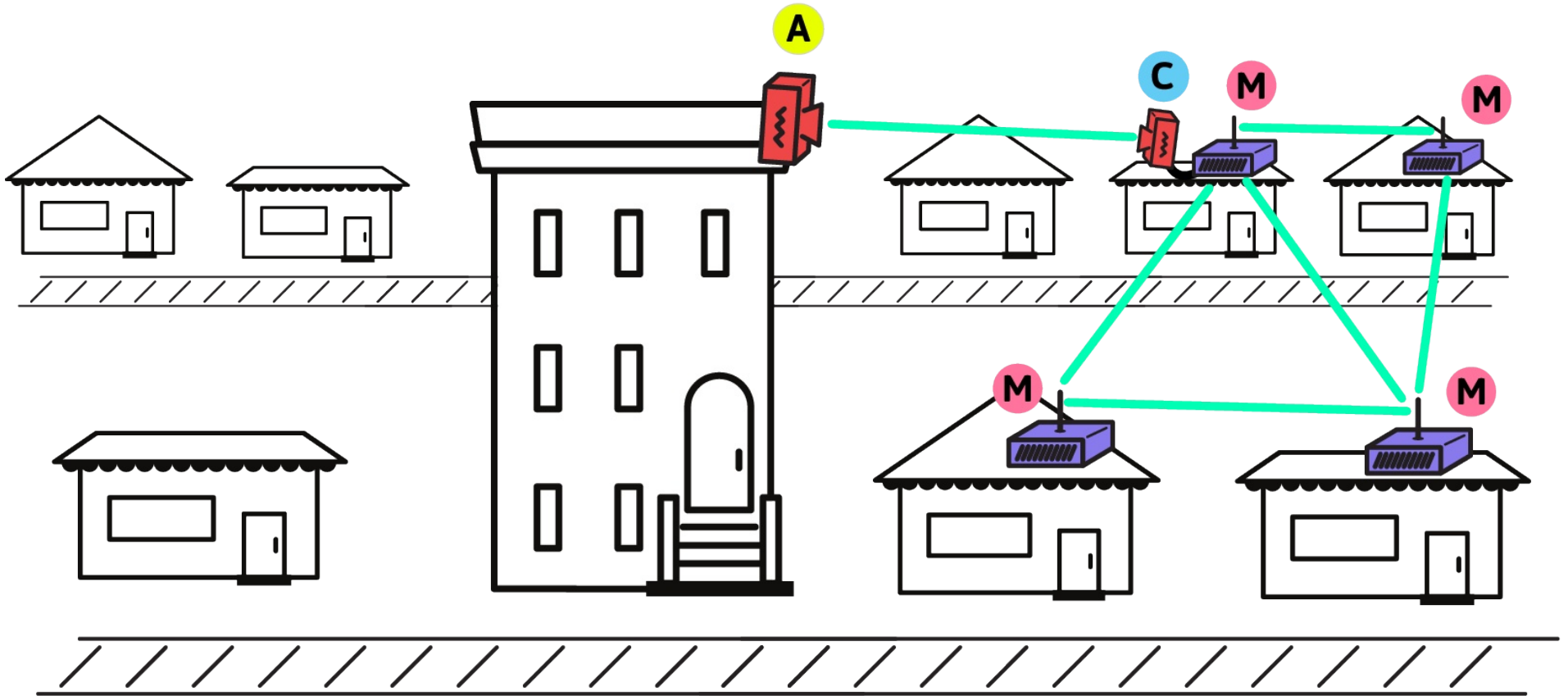
Worksheet 1: Mesh Example

This solution places routers in a window of each home. They are all configured as **Mesh Nodes**, and connect to each of their neighbors.



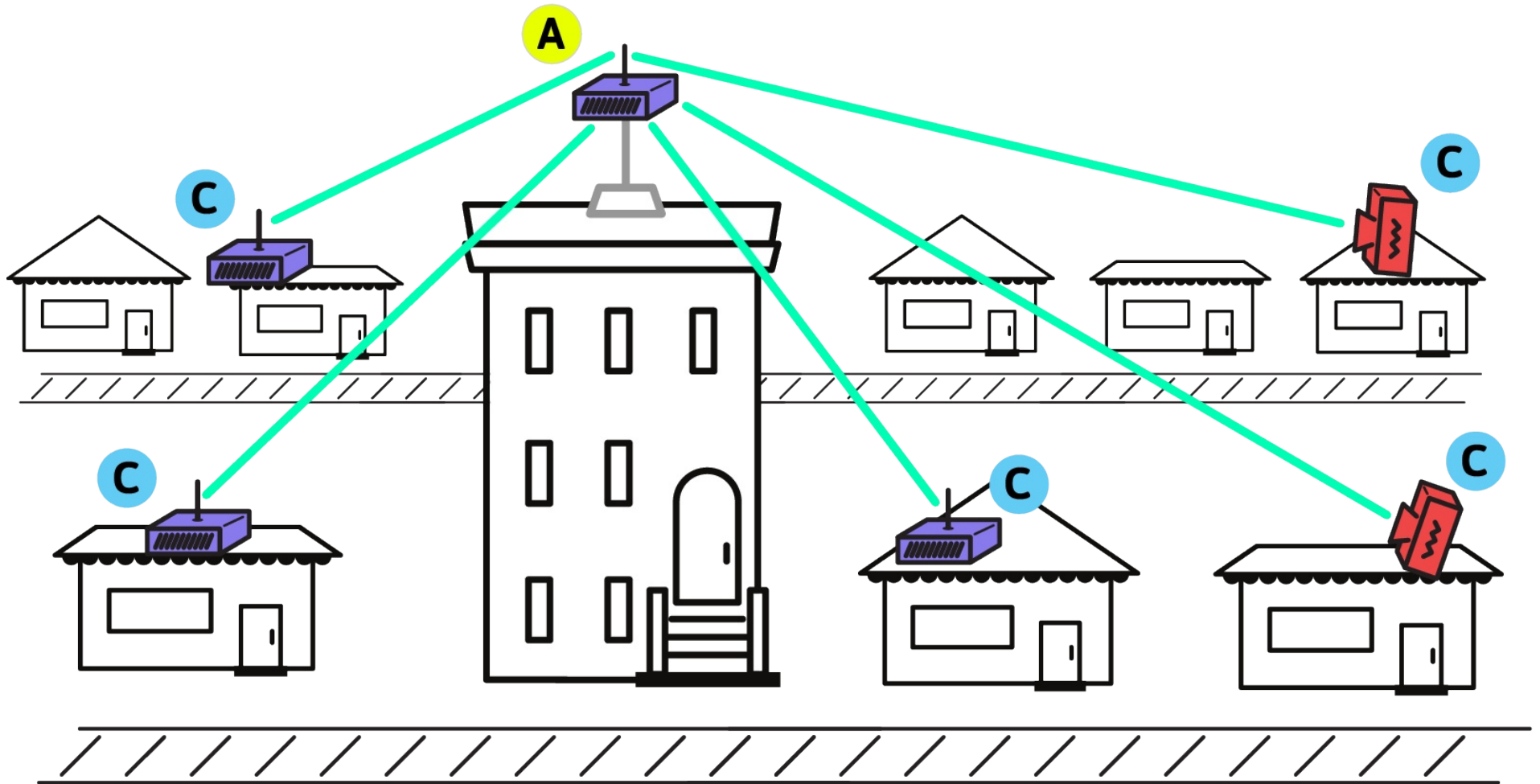
Worksheet 2: Hybrid Example

This solution combines a cluster of **Mesh Nodes** with two routers set up as an **Access Point** and **Client** pair. The Client router is connected with an Ethernet cable to one of the Mesh Nodes, connecting everything together.



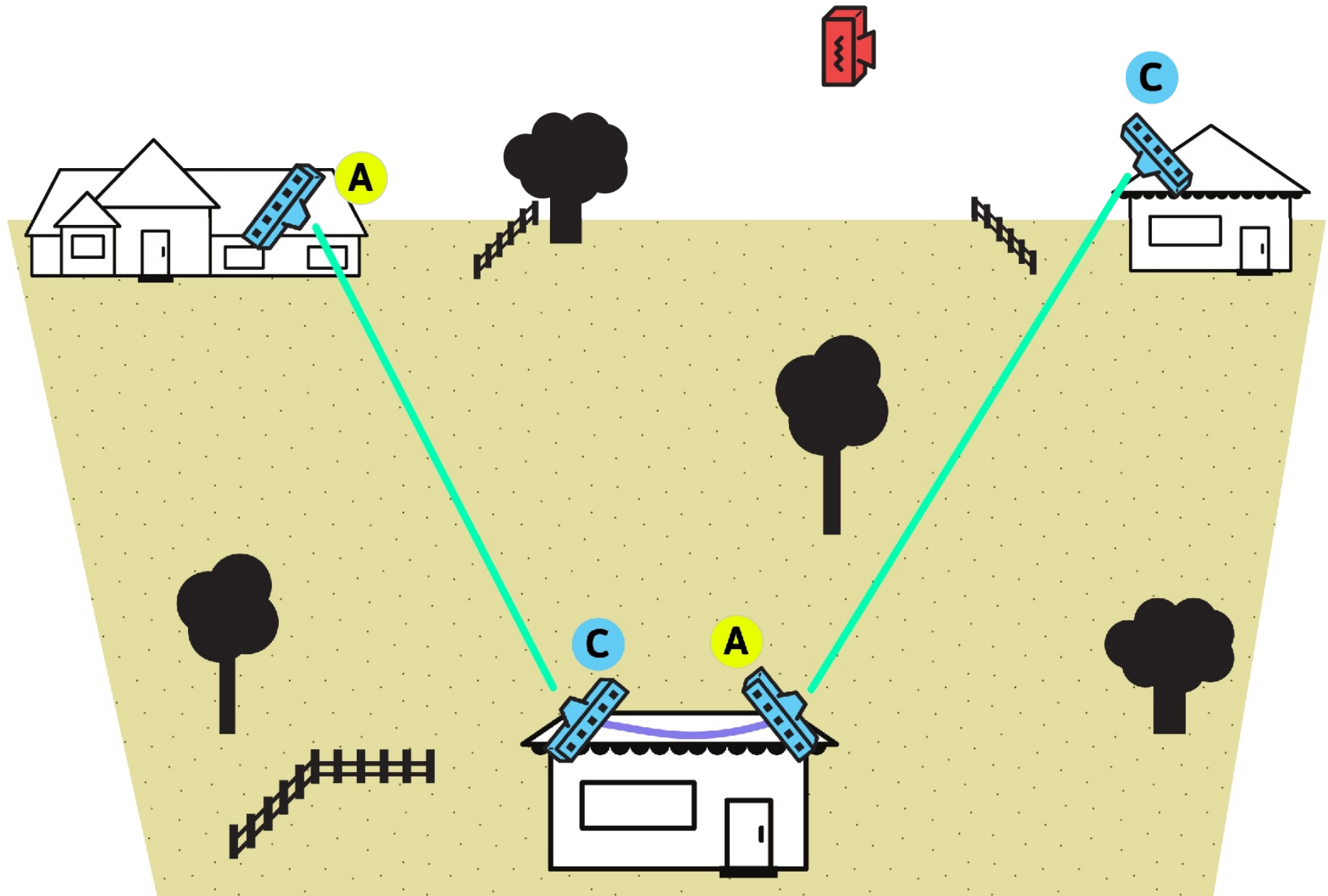
Worksheet 2: Access Point Example

This solution puts a router on the roof of the tall building to provide an **Access Point (AP)**. The other nearby routers are placed on rooftops, configured as **Clients**, and connect together through the **AP**. Two directional routers are used for the furthest homes to connect to the AP.



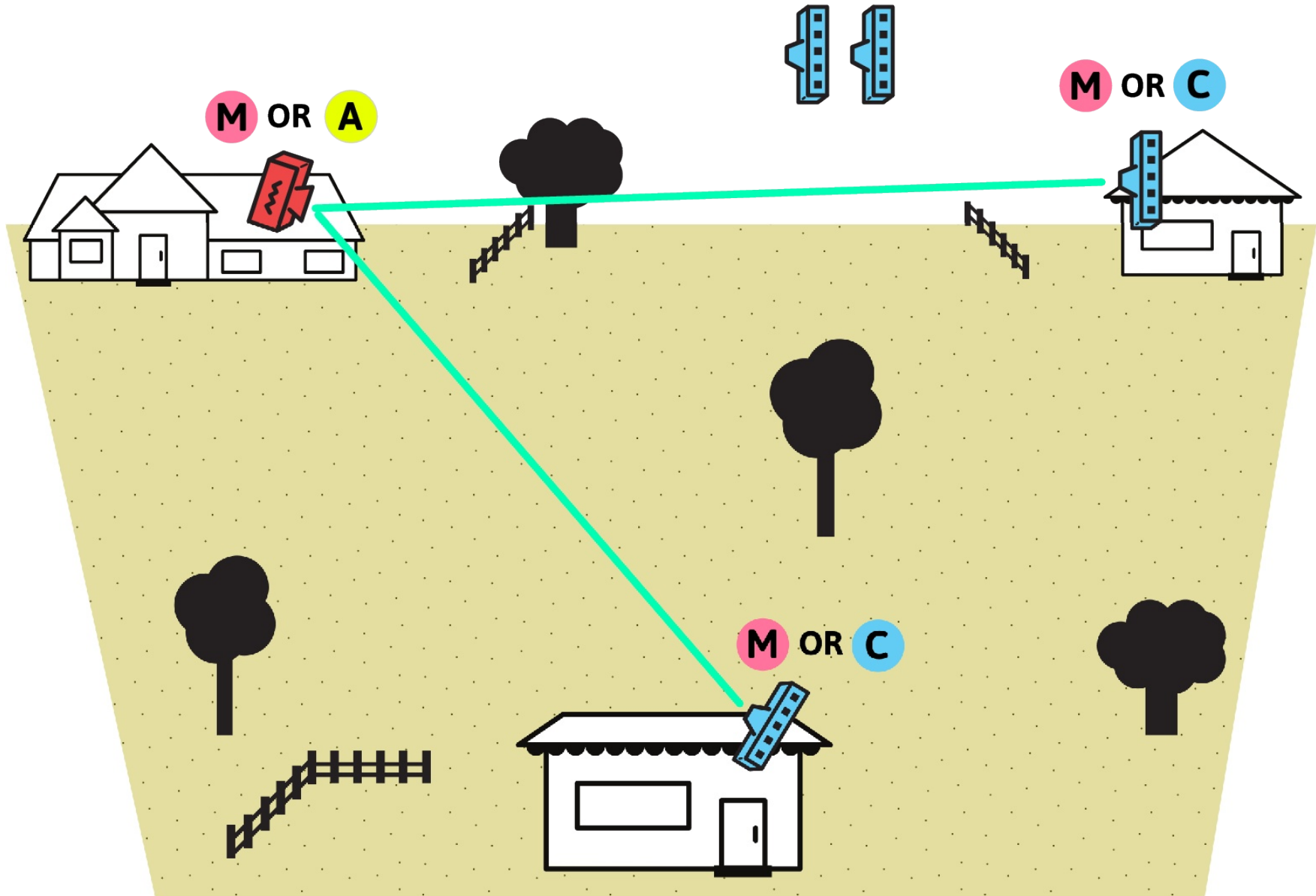
Worksheet 3: Point-to-Point Example

This solution puts a router on the roof of each home. Two are configured as **Access Points** (AP), and two are configured as **Clients**. The home with two routers bridges the connections together with an Ethernet cable, forming a single network.



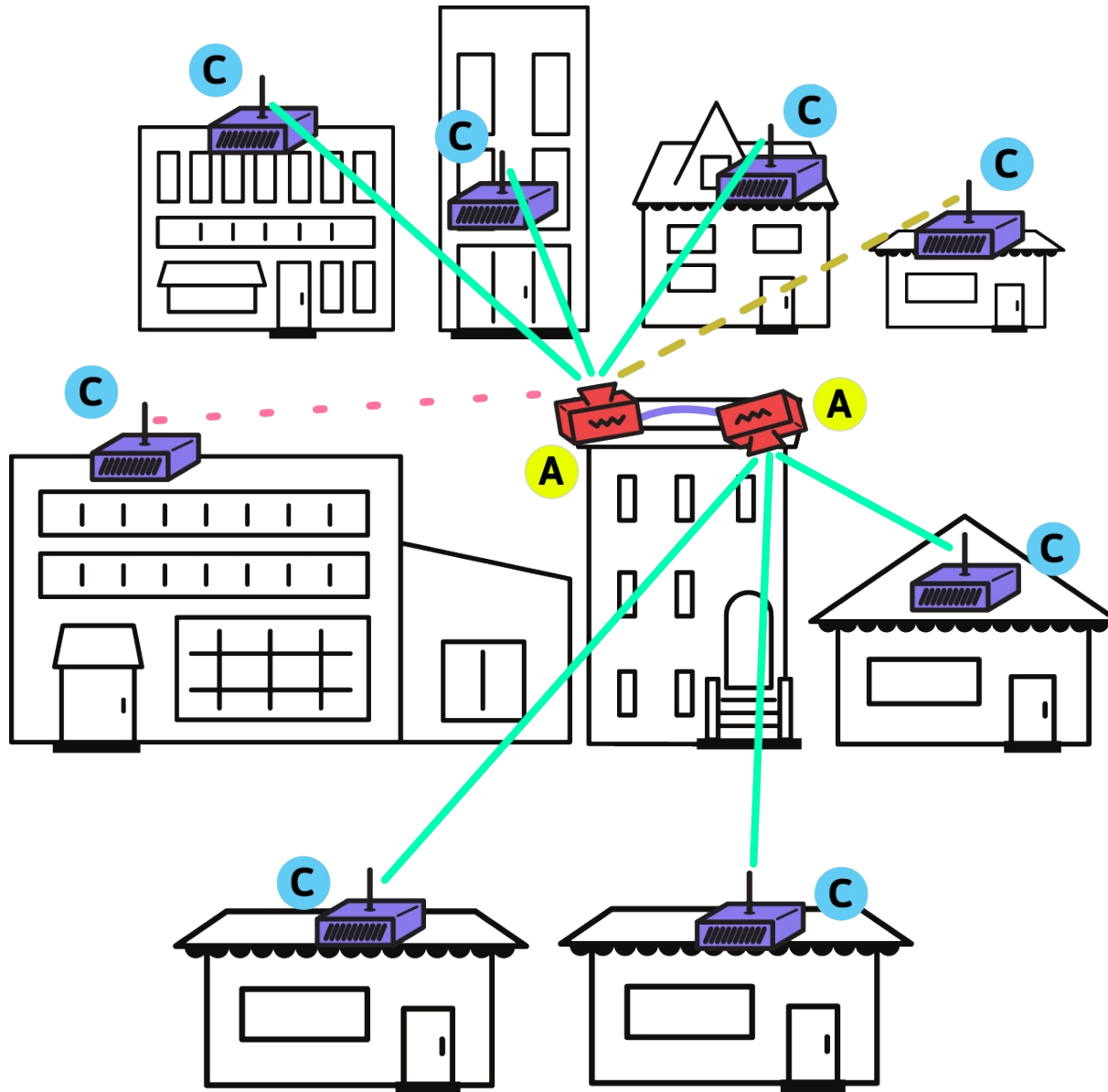
Worksheet 3: Mesh or Access Point Example

This solution puts a router with a wide "sector" directional antenna on the top of one home, and two with more focused antennas pointing back. The three routers can all be configured as **Mesh Nodes**, or the router with the sector antenna can be an **Access Point**, and the others set as **Clients**. Both will work. This uses the least amount of equipment.



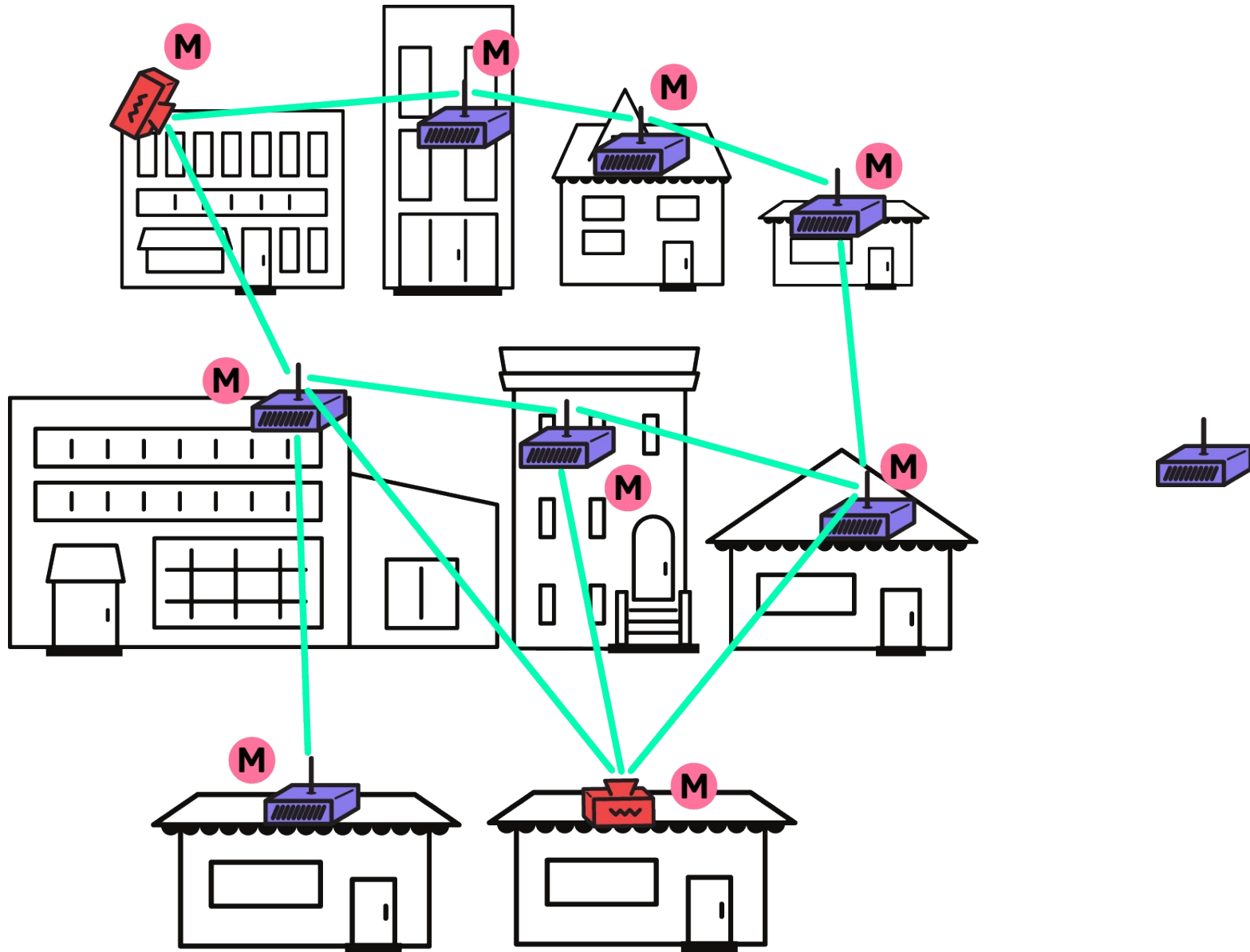
Worksheet 4: Access Point Example

This solution uses the building in the middle as a high point to provide an **Access Point** to the rest of the buildings. Routers mounted outdoors or in the windows of the other buildings are configured as **Clients**. Note that some of the links are weak as the angle to the directional antenna is not ideal.



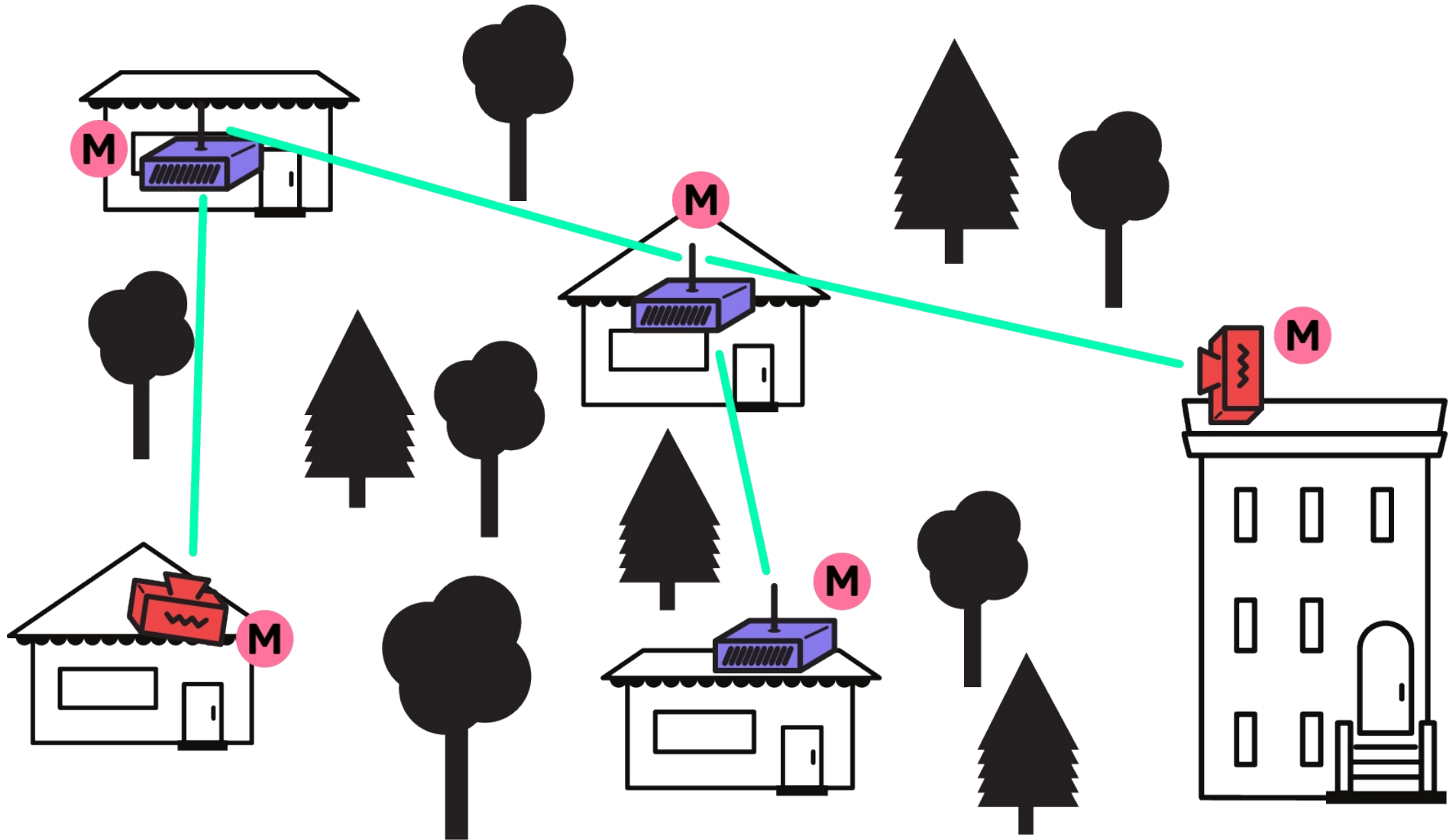
Worksheet 4: Mesh Network Example

This solution uses a mixture of the omnidirectional and directional routers to connect all of the buildings in a **Mesh**. Depending on where the routers are placed (on rooftops, or in windows), they may not all connect, as the signal will not have line of sight. Despite this a continuous network is formed.



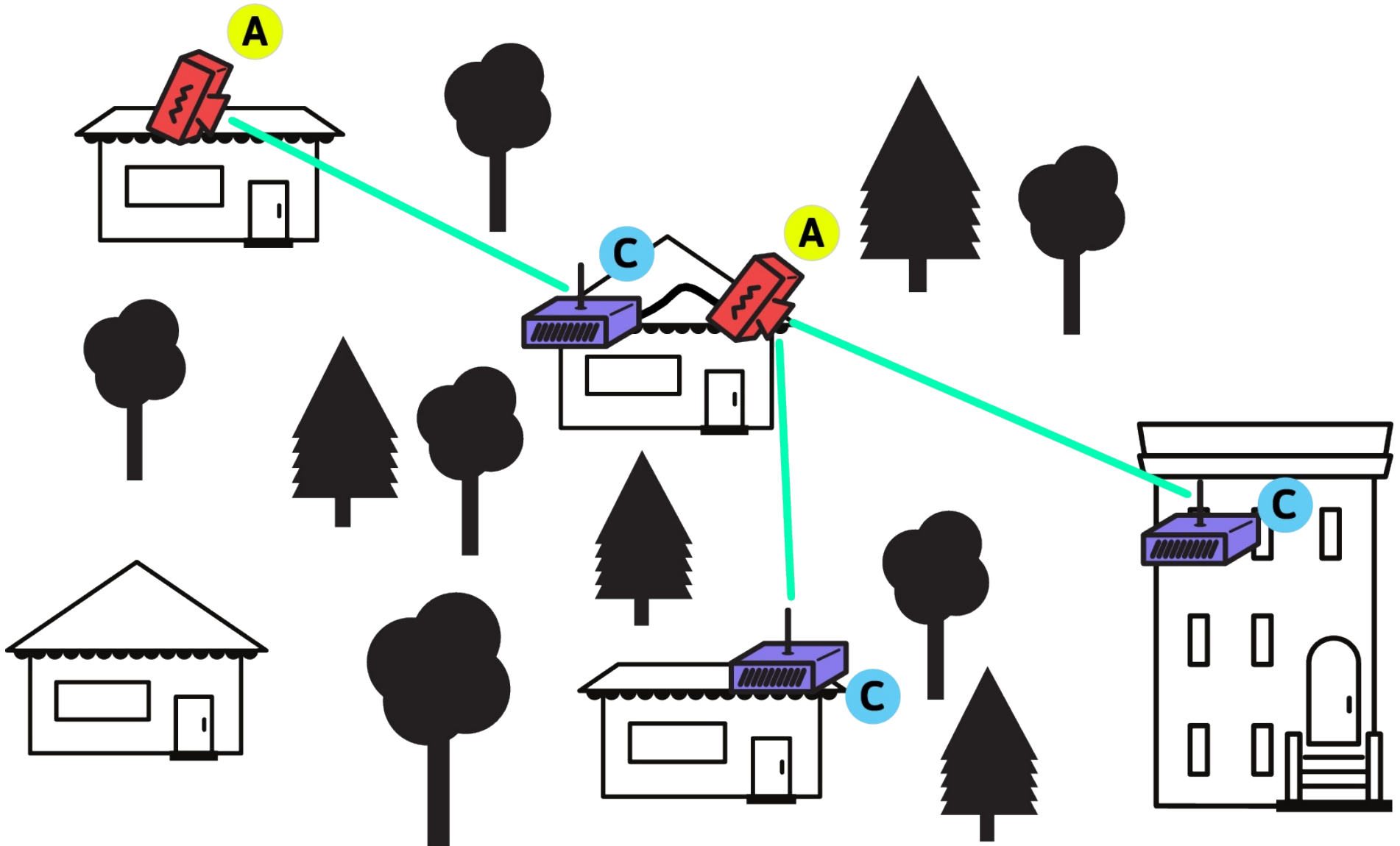
Worksheet 5: Mesh Network Example

This solution uses a mixture of the omnidirectional and directional routers to connect all of the buildings in a **Mesh**. Though the trees block some routers from connecting, a continuous network is formed.



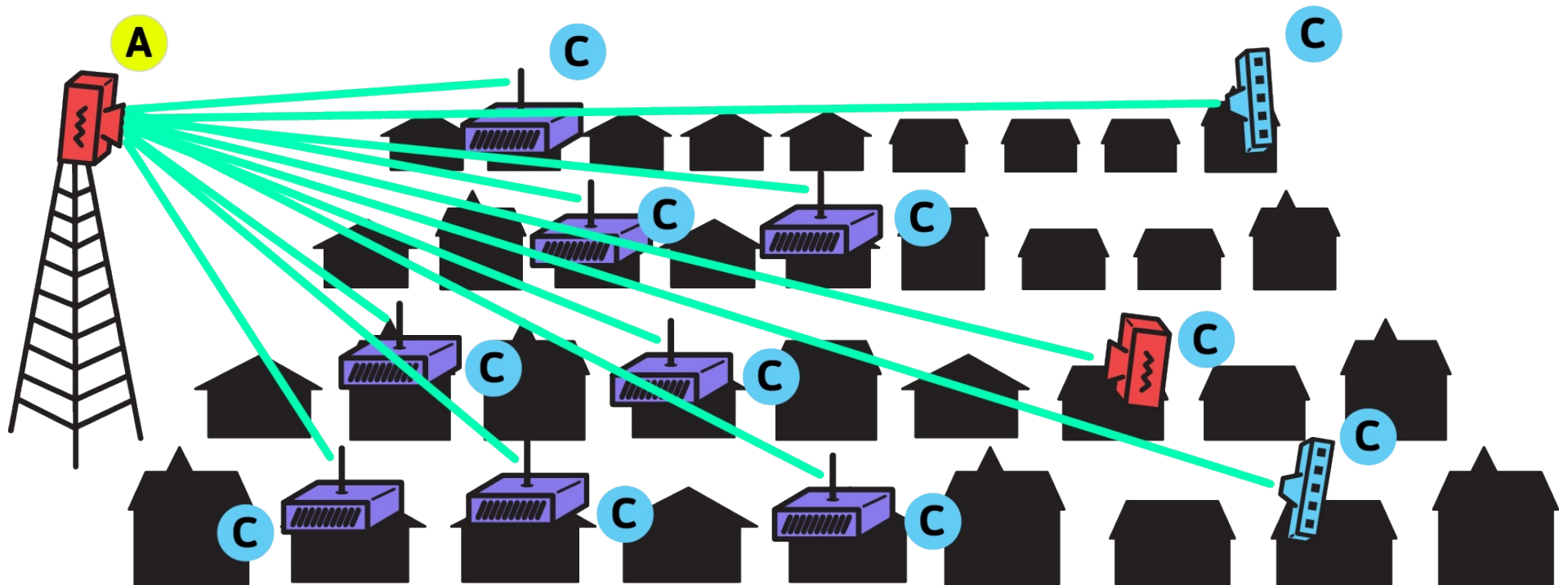
Worksheet 5: Access Point and Client Example

This solution uses the directional routers set up as **Access Points**, with the omnidirectional routers configured as **Clients**. The building in the center chains a Client to another Access Point to connect the buildings into a single network. There are not enough routers to connect every building using this method.



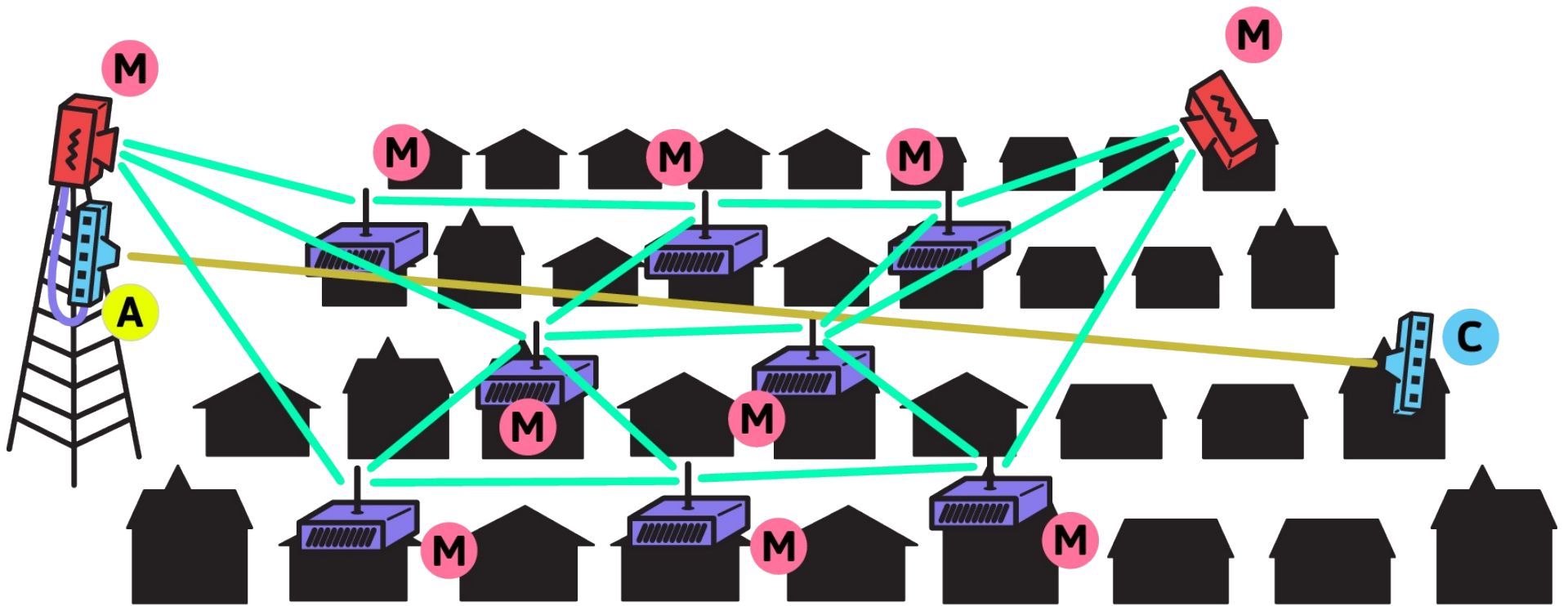
Worksheet 6: Access Point and Client Example

This solution uses the one of the directional routers set up as an **Access Point** on the tall tower. The rest of the routers are configured as **Clients**. The routers that are furthest away are directional or focused, to ensure there is a strong signal back to the tower. Note the number of connections to the router on the tower - too many and it could be overwhelmed.



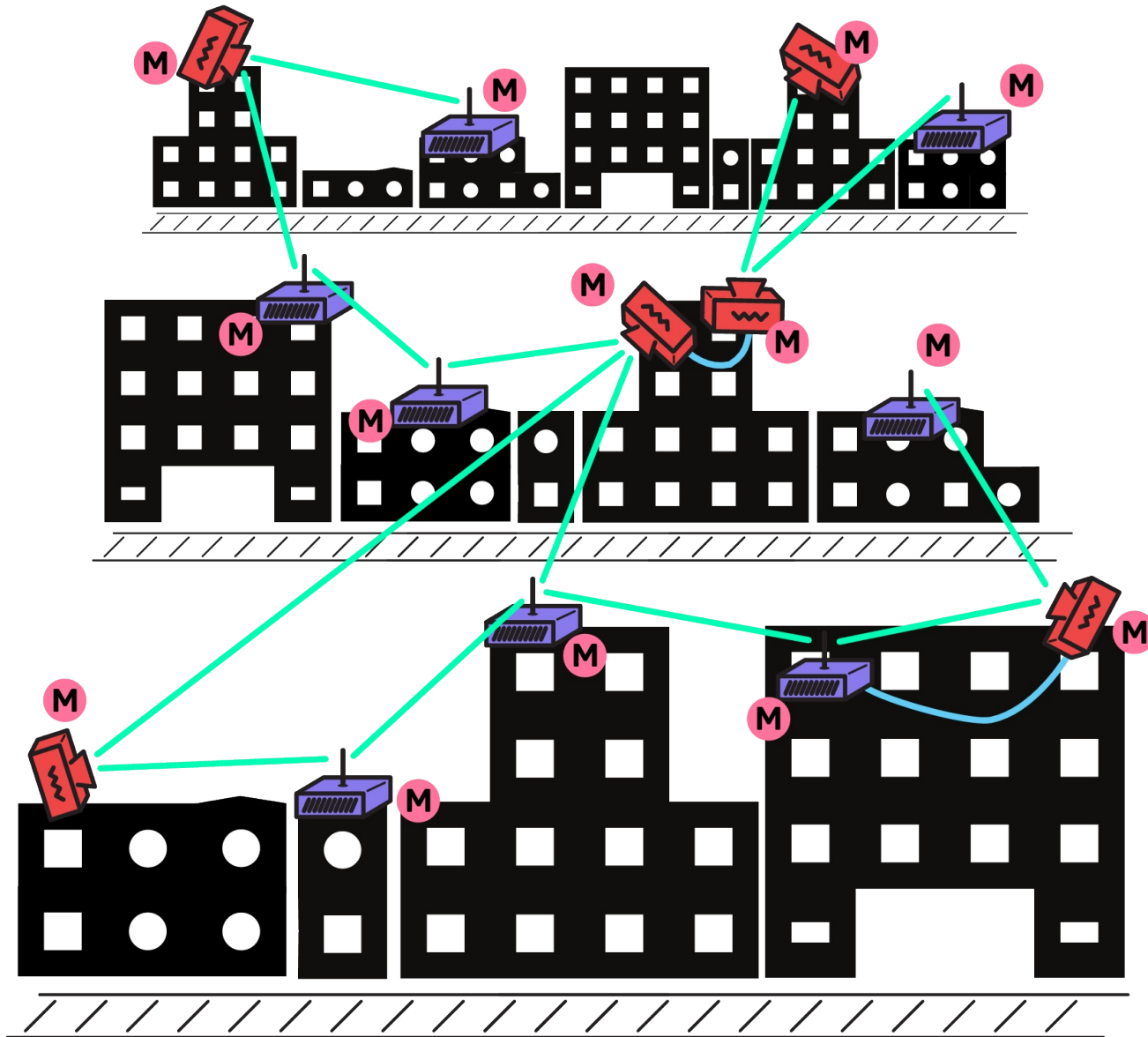
Worksheet 6: Hybrid Example

This solution uses most of the routers as **Mesh Nodes**. Both directional and omnidirectional nodes (including a directional node on the tower) connect to form a strong mesh. There is a single pair of focused routers set up as an **AP** and **Client** pair, for a point-to-point link. This could be to provide the connection to the Internet through the building hosting the client, as an example of why this may be set up this way.



Worksheet 7: Mesh Node Example

This solution uses both directional and omnidirectional routers set up as **Mesh Nodes**. Several are linked together with Ethernet cables to bridge parts of the network. Note how the signal routes "around" the difference in height in the buildings by bouncing back and forth between the rows of buildings.



Worksheet 7: Access Point and Client Example

This solution uses several of the directional routers configured as **Access Points**. The rest of the routers are configured as **Clients**. Several of the APs are clustered together. One set of APs is connected to another AP through a Client router - networks can be chained together.

