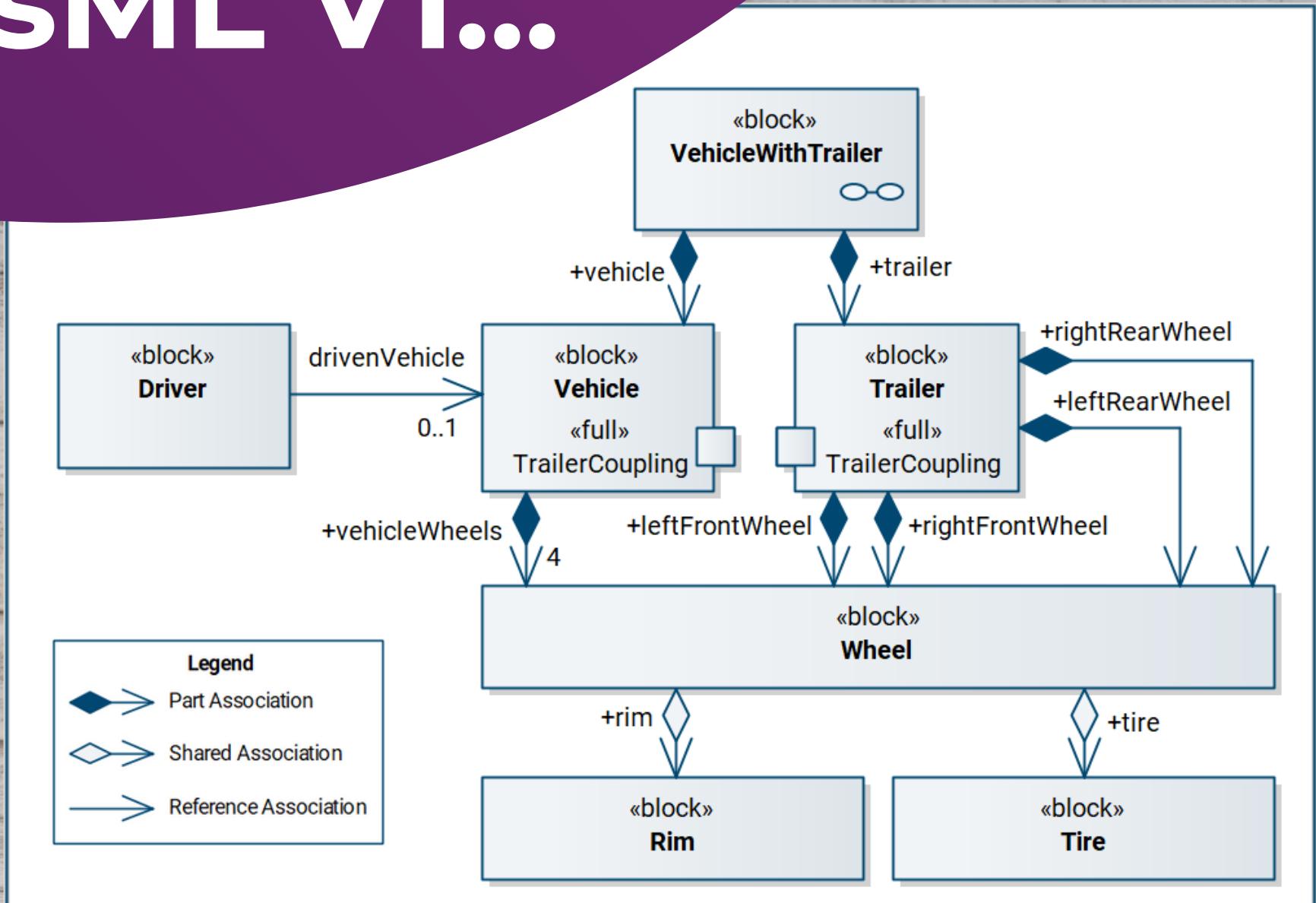


When to use an Item or Part Reference in SysML V2 Beta 1...

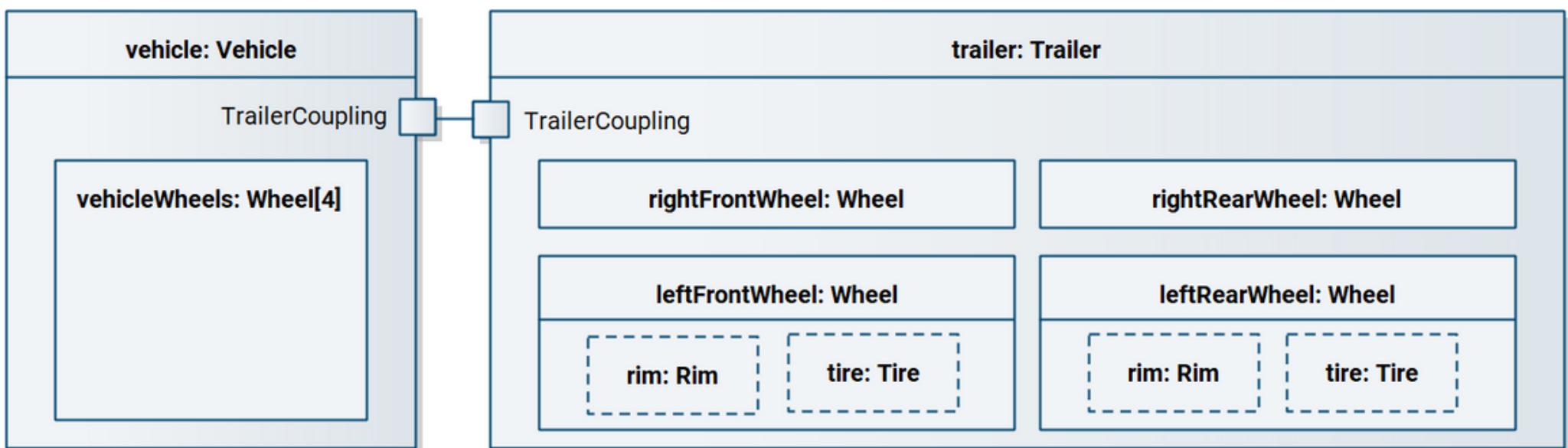


... and what is the difference between a definition and a usage?

The example in SysML V1...



ibd [block] VehicleWithTrailer [VehicleWithTrailer]



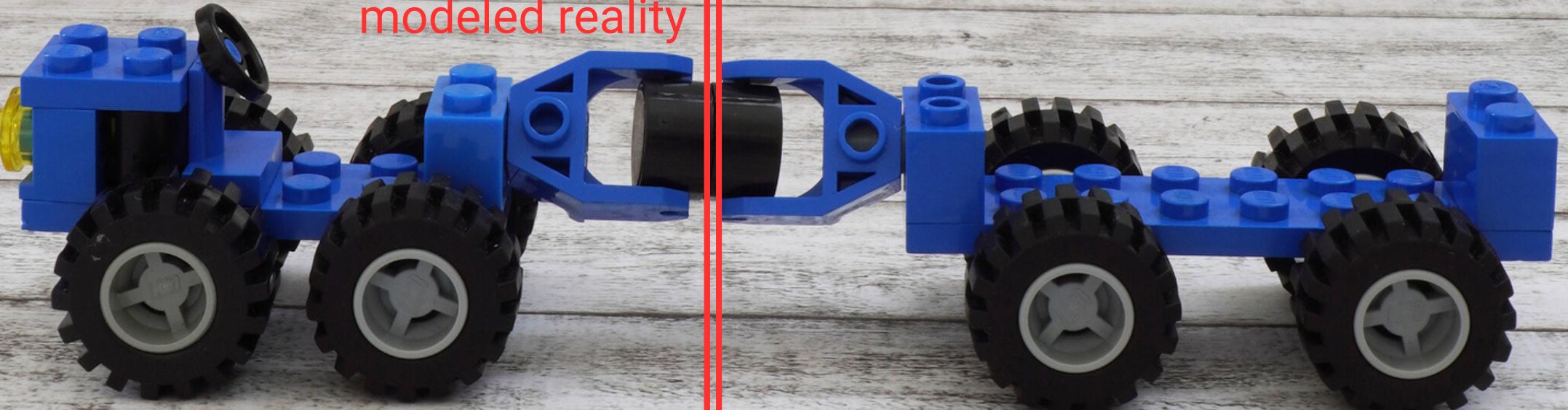
```

package 'System of Interest' {
    part def VehicleWithTrailer {
        part vehicle : Vehicle;
        usages
        part trailer : Trailer;
    }
    definitions
    part def Vehicle;
    part def Trailer;
}

```



modeled reality



System of Interest

«part def»
VehicleWithTrailer

vehicle: Vehicle

trailer: Trailer

«part def»
Vehicle

«part def»
Trailer

// ...

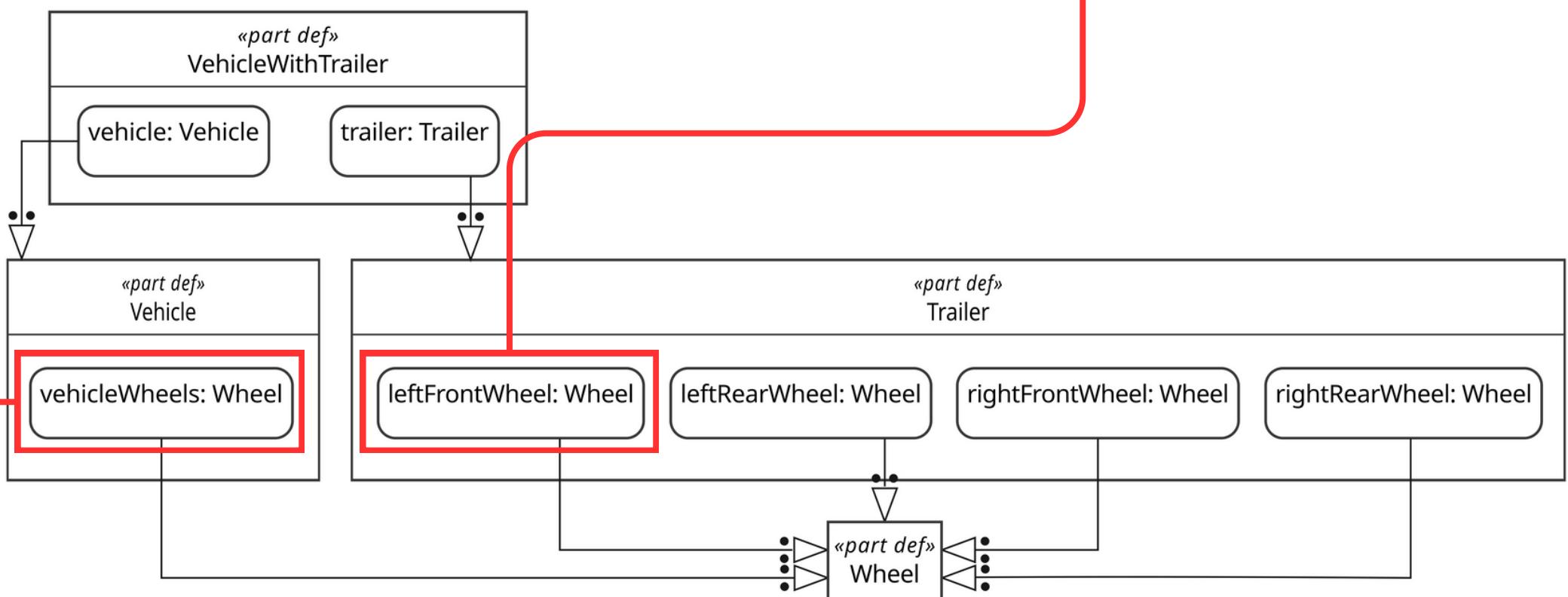
```
part def Vehicle {  
    part vehicleWheels : Wheel[4];  
}
```

```
part def Trailer {  
    part rightRearWheel : Wheel;  
    part rightFrontWheel : Wheel;  
    part leftRearWheel : Wheel;  
    part leftFrontWheel : Wheel;  
}
```

```
part def Wheel;
```



System of Interest



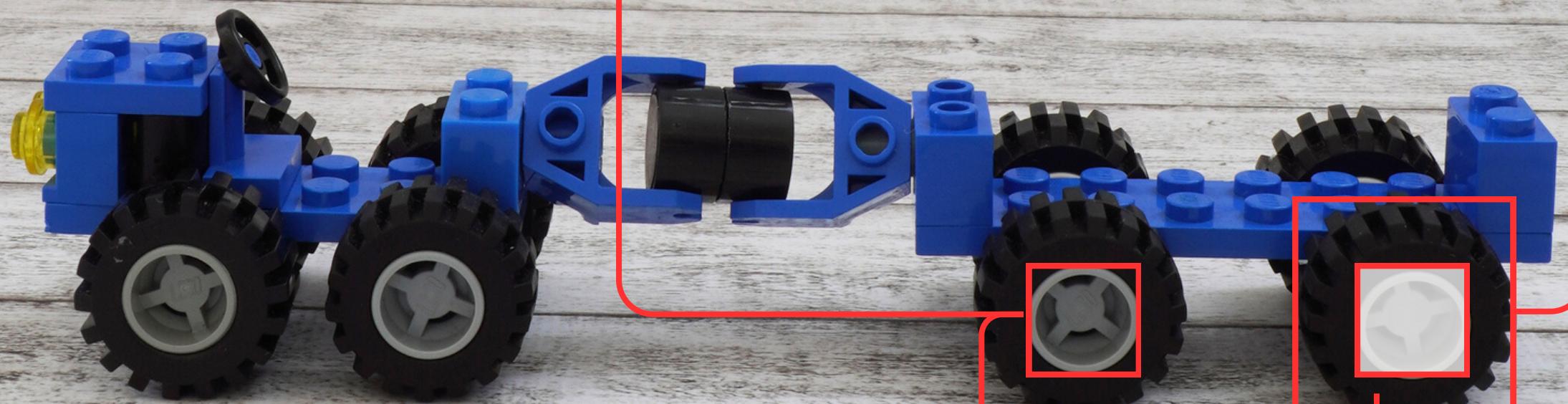


```
// ...
```

```
part def Wheel {  
    ref part rim : Rim;  
    ref part tire : Tire;  
}
```

```
part def Rim;
```

```
part def Tire;
```



«*part def*»
Wheel

tire: Tire

rim: Rim

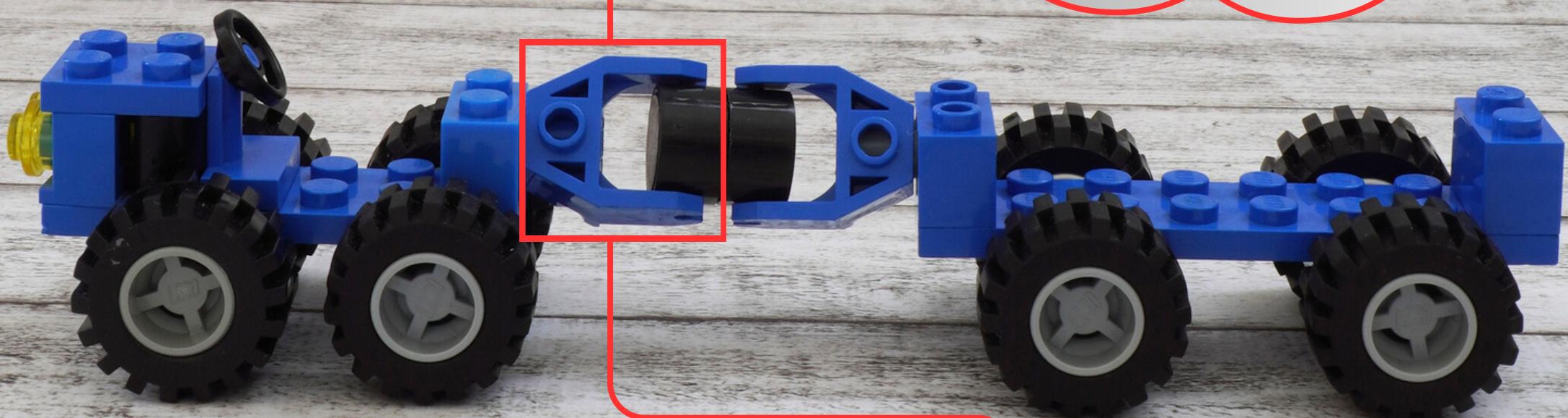
// ...

```
part def Vehicle { // ...
    part trailerCoupling : TrailerCoupling;
    port trailerCouplingMagnet : Magnet;
    binding trailerCouplingBinding
        bind trailerCouplingMagnet = trailerCoupling.magnet;
}
```

```
part def TrailerCoupling {
    port magnet : Magnet;
}
```

```
port def Magnet;
```

A SysML V1 **full port** became a part and a port in SysML V2, because a **port def** is not a kind of **part def!**



«part def»
Vehicle

vehicleWheels: Wheel

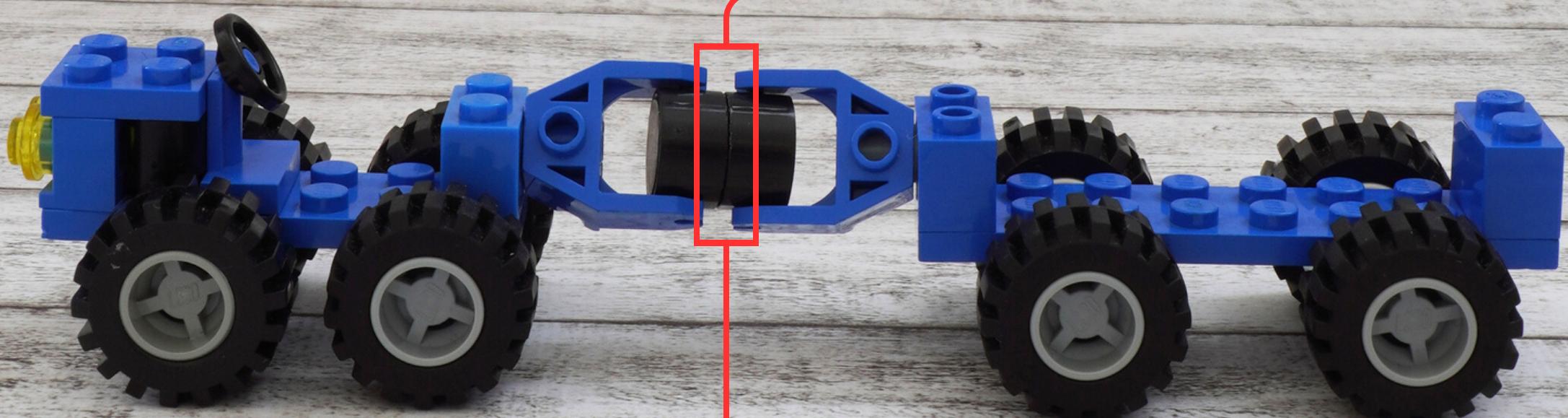
magnet: Magnet
trailerCoupling: TrailerCoupling *

trailerCouplingMagnet: Magnet

```
// ...
part def VehicleWithTrailer { // ....
    connection vehicleTrailerConnection : MagneticConnection {
        end vehicleEnd ::> vehicle.trailerCouplingMagnet;
        end trailerEnd ::> trailer.trailerCouplingMagnet;
    }
}
```

```
connection def MagneticConnection {
    end northEnd : Magnet;
    end southEnd : Magnet;
}
```

A **connection def** is a kind of **part def**, thus it can have additional features.



«*part def*»
VehicleWithTrailer

vehicle: Vehicle

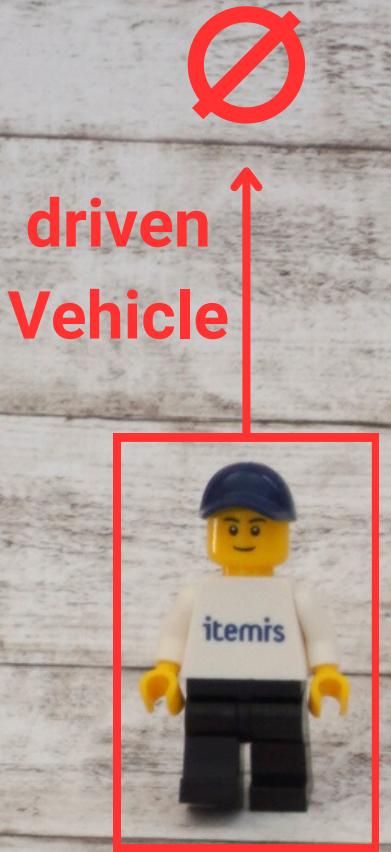
trailerCouplingMagnet: Magnet

trailer: Trailer

*

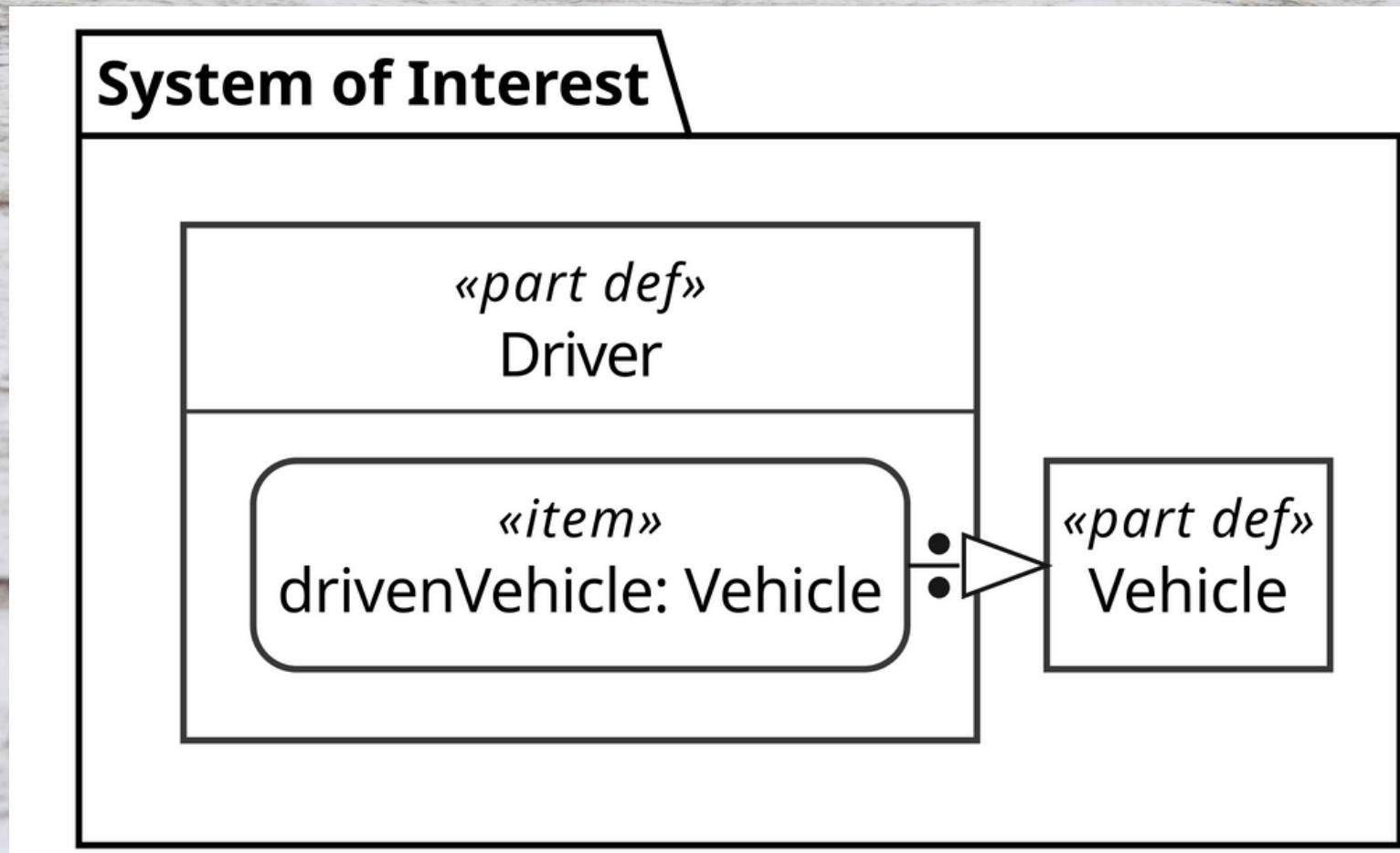
trailerCouplingMagnet: Magnet

(The position and size of the port labels were adjusted manually.)



```
package 'System of Interest' {  
    part def Driver {  
        ref item drivenVehicle : Vehicle;  
    }  
  
    part def Vehicle {  
        // ...  
    }  
    // ...  
}
```

Driver and Vehicle are
not parts of the same system,
thus an **item ref** is used.

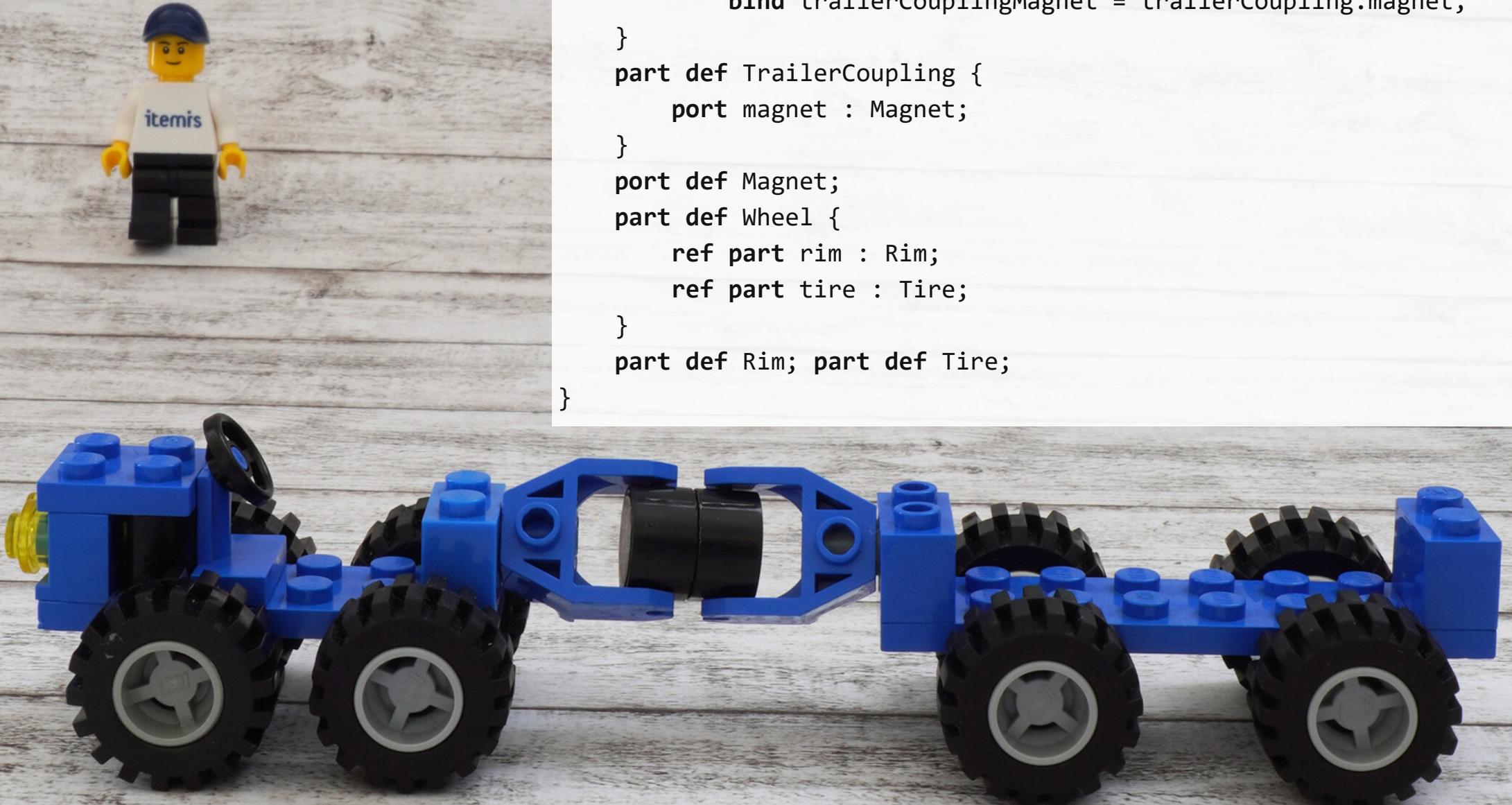


```

package 'System of Interest' {
    part def Driver {
        ref item drivenVehicle : Vehicle;
    }
    part def VehicleWithTrailer {
        part vehicle : Vehicle;
        part trailer : Trailer;
        connection vehicleTrailerConnection : MagneticConnection {
            end vehicleEnd ::> vehicle.trailerCouplingMagnet;
            end trailerEnd ::> trailer.trailerCouplingMagnet;
        }
    }
    connection def MagneticConnection {
        end northEnd : Magnet;
        end southEnd : Magnet;
    }
    part def Vehicle {
        part vehicleWheels : Wheel[4];
        part trailerCoupling : TrailerCoupling;
        port trailerCouplingMagnet : Magnet;

        binding trailerCouplingBinding
            bind trailerCouplingMagnet = trailerCoupling.magnet;
    }
    part def Trailer {
        part rightRearWheel : Wheel; part rightFrontWheel : Wheel;
        part leftRearWheel : Wheel; part leftFrontWheel : Wheel;
        part trailerCoupling : TrailerCoupling;
        port trailerCouplingMagnet : Magnet;
        binding trailerCouplingBinding
            bind trailerCouplingMagnet = trailerCoupling.magnet;
    }
    part def TrailerCoupling {
        port magnet : Magnet;
    }
    port def Magnet;
    part def Wheel {
        ref part rim : Rim;
        ref part tire : Tire;
    }
    part def Rim; part def Tire;
}

```





**Do you find this
example helpful?
Feel free to share
and comment!**