Rad Chad's Rad Bikes

True to his name, Rad Chad is, in fact, pretty rad. He became famous for taking his bike off some sweet jumps and is leveraging his fame to start a bicycle company. He has commissioned us to build the database for his company's information system.

After extensive conversation, our requirements gathering team has written the narratives for three different subsystems: **Sales**, **Purchasing**, and **Materials Management**.

In groups, create the ERDs from these narratives in Draw.io. When in doubt, use your best guess as to the properties of attributes (composite, required, derived, multivalue, unique).

Group 1 - Sales

Customers can purchase one or more items and those sales are recorded as Sales Orders.

For each customer, we will need a unique name and a phone number. Each customer may also have multiple addresses, but should have at least one address. We will identify each customer by assigning them a unique customer number. Each customer must also have a phone number.

Each Item will be identified by a unique item number. For each item, we will also require a unique name. Each item must also include a description and a list price.

When a sale is made, we must record the sale as a Sales Order including a required date and a system-generated unique order number. Optionally, when a sale is recorded, we may add notes to the order.

Each customer can optionally place many orders, but each order must be placed by one and only one customer. Each sales order can include one or more items, and each item can be optionally sold on many different orders. When an item is sold on a sales order, we must also include the quantity sold and the price at which that item was sold.

Group 2 - Purchasing

RCRB will purchase items from vendors. These purchases will be recorded on purchase orders.

Each vendor will be identified by a unique system-generated vendor number and will require a unique name. Each vendor can have more than one address, but must have at least one. We also require a phone number for each vendor.

Each item will have a unique system-generated item number and require a unique name. For each item, we will also require a description of the item and the cost at which it will be inventoried.

Each purchase order will have a unique system-generated order number and require the date on which the order was placed. For each purchase order, we can optionally add notes.

We can place many orders with each vendor, but each order must be from one and only one vendor.

Each order can be for more than one item, but must include at least one item. Each item can be ordered multiple times. Because not all items are purchased (some are manufactured), each item does not have to be on a purchase order. If we do order an item via purchase order, we must include the quantity ordered and the cost of the item for this purchase order.

Group 3 - Materials Management

Items will be inventoried in warehouses, which will be subdivided into locations.

Each warehouse will be identified by a unique system-generated warehouseID and will require a unique name. We also require an address for each warehouse.

Each item will have a unique system-generated item number and require a unique name. For each item, we will also require a description of the item. We also require that the item maintain a quantity in hand, which will be derived by adding up the quantities in all locations in all warehouses.

Each location will be identified by a unique system-generated locationID and will require a unique name.

Each warehouse can have many locations, but each location must exist in one and only one warehouse.

Each location can optionally contain many items, and each item can be stored in more than one location. When an item is stored in a location, we need to track the quantity in that location.