CAS Geology Data Requirements

Lots
- Every lot has a unique number.
- Every lot has a locality number.
- Some lots contain specimens with unique id numbers (eg specimen ids or photo ids).

Lots are a group of one or more specimens. Lots have one unique number and share all attributes. Lots come from one unique locality and are assigned to one taxon.
- Lot primary key: lotID.
- Foreign key: locationID
- Lot attributes: locality, taxon, number of specimens, etc

Localities
- A locality number can belong to many lots, but a lot can only have one locality number.
- A locality has a unique number with many attributes.

Localities are represented by one unique number and share many attributes relating to geography and chronostratigraphy. One locality can be shared by many lots
- Locality primary key: locationID
- Attributes: collector, collection date, geography, etc

References
- A reference, aka a publication, has a unique number.
- One reference/publication can have many lots published in it, and one lot can be part of many publications.

References/publications are represented by one unique number and store information about a publication (eg author, journal title, etc)..
- Reference/publication primary key: referenceID
  - Note that was historically called "citation #" in Filemaker

Citations
- Citations have unique numbers.
- Citations represent the instance where a lotID is published in a publication
- A lot can be part of many citations, and a citation can have many lots.

Citations track which lots have been published in which references/publications. A citation can publish many lots. One lot can be published in many citations.
- Primary key: compound key of lotID and referenceID

<u>Loans</u>

- Each loan has a unique id number.
- Many lots can be included in many different loans, and a loan can have many lots.
- Each loan is assigned to a person

Loans track where lots get loaned. A lot can be on many loans. A loan can have many lots. Attributes include due date, delivery method,etc
   - Primary key: loanID
   - Foreign key: personID

<u>Loan Lots</u>
- Since many lots can be included in many different loans, and a loan can have many lots there is a separate table to track this information.
   - Primary key: compound key of lotID and loanID

<u>People</u>
- Each person who takes out a loan has a unique id.
- Many people may take out many loans, and one loan may be associated with more than one person.

The person table records people that take out loans, but may include people of general interest to the department. It includes their ORCID.
   - Primary key: personID

<u>Acquisitions</u>
- An acquisition has a unique number
- An acquisition can have many lots
- A lot will only belong to one acquisition.
- Supporting documents and paperwork from an acquisition will be identified with the acquisitionID

Acquisitions record when lots have been accessioned and track their supporting paperwork. An acquisition can include many lots. A lot can belong to only one acquisition.
   - Primary key: acquisitionID
   - Attributes: date received, date accessioned, who donated the material/where it came from, location of stored paperwork, URL or filepath to scan of documents

Entity Tables:
- Lot
- Locality
- Reference
- Loan
- Person
- Acquisition
- Loan Lots
- Lot is Published In

Pink = primary key
Green = foreign key
Blue = attributes

Lot

lotID	localityID	acquisitionID	genus	species	etc

Locality

localityID	collector	age	country	state	etc

Acquisition

acquisitionID	personID	date	Docs URL	Paperwork location	etc

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Reference

referenceID	author	journal	Publication date	title	etc

Loan

loanID	personID	Date loaned	Date due	Sent via	etc

Person

personID	First name	Last name	ORCID ID	Wikidata ID	etc

Loan Lots (for M:N relationship)

lotID	loanID	notes			

Is Published In (for M:N relationship)

referenceID	lotID	Published type	Page # & fig #		

Relationships:
- Lot === has --- locality
  - Total participation: a lot must have a locality
  - Partial participation: a locality does not always have a lot assigned to it
  - 1:N cardinality: a lot has one locality; a locality can have many lots
- Lot --- published in --- reference/publication
  - Partial: a lot can be published in a reference but doesn't have to be
  - Partial: a reference can publish a lot but doesn't have to
  - M:N : a lot can be published in many references; a reference can publish many lots
- Lot --- is part of === loan
  - Partial: lot can be part of loan, but doesn't need to be
  - Total: loan always contains a lot
  - M:N : a lot can be part of many loans; a loan can contain many lots

- Loan === sent to === person
  - Total: loan is always sent to a person
  - Total: person is always sent a loan (may not be case if you want to just store people though. Revisit later)
  - 1:N : a loan gets sent to one person; a person can have many loans

- Acquisition===has===lot (need to revisit after building out acquisition table)
  - Total: a lot always belongs to an acquisition
  - Total: an acquisition always has lots
  - 1:N : a lot belongs to one acquisition, an acquisition can have many lots

- Lot --- has === specimen ID (need to revisit topic of using specimenIDs)
  - Partial: a lot won't always have a specimen ID
  - Total: a specimen ID will always have a lot ID
  - 1:N : a lot can have multiple specimen IDs in it; a specimen ID always has one lot ID