

# Common Education Data Standards

 **ies** NATIONAL CENTER FOR  
EDUCATION STATISTICS

Institute of Education Sciences

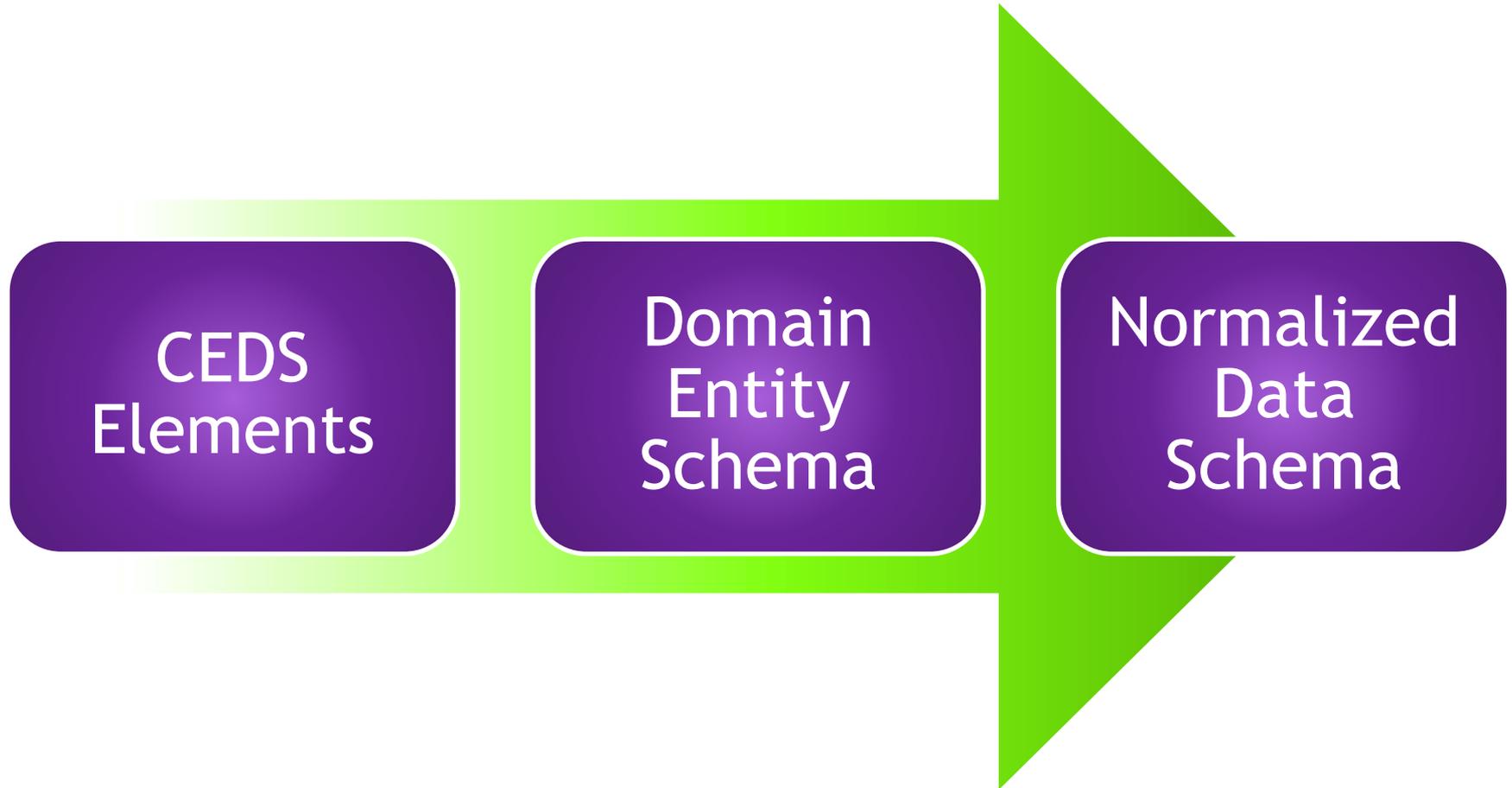
<http://ceds.ed.gov>

The logo features a large green ring centered on a white background. Inside the ring, the text "CEDS Data Model" is displayed in a bold, purple, sans-serif font. The text is centered and has a slight drop shadow. The entire logo is set against a background of concentric, light gray circles that fade out towards the edges of the image.

**CEDS**  
**Data Model**

# The CEDDS Data Model Process

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# CEDS Domain Entity Schema (DES)

- Early Learning
- K12
- Postsecondary
- Career and Technical
- Adult Education
- Workforce
- Assessments
- Learning Standards
- Learning Resources
- Authentication and Authorization

Domain	Entity	Domain	Entity
EL	EL Child	K12	K12 School
EL	Parent/Guardian	K12	Local Education Agency (LEA)
EL	EL Family	K12	State Education Agency (SEA)
EL	EL Organization	K12	K12 Student
EL	EL Staff	K12	Parent/Guardian
EL	Staff Credential	K12	K12 Staff
	Staff Professional Development	K12	K12 Course
EL	Activity	K12	Course Section
	Professional Development	K12	Assessments
EL	Requirement	K12	Program
EL	Professional Development Activity	K12	Incident
EL	Professional Development Session	K12	Calendar
EL	Technical Assistance	K12	Learning Resource
EL	EL Class/Group	K12	Financial Account
	<b>Domain Entity</b>	K12	Organization Account Value
PS	PS Institution	K12	Session
PS	PS Student	K12	Rubric
PS	PS Section	K12	Rubric Criterion
PS	PS Staff	K12	Rubric Criterion Level
PS	PS Applicant	K12	Allergy
PS	Parent/Guardian	K12	Staff Credential
PS	Assessment		Staff Professional Development
PS	Learning Resource	K12	Activity
PS	Learning Goal		Professional Development
PS	Authentication	K12	Requirement
PS	Authorization	K12	Professional Development Activity
		K12	Professional Development Session

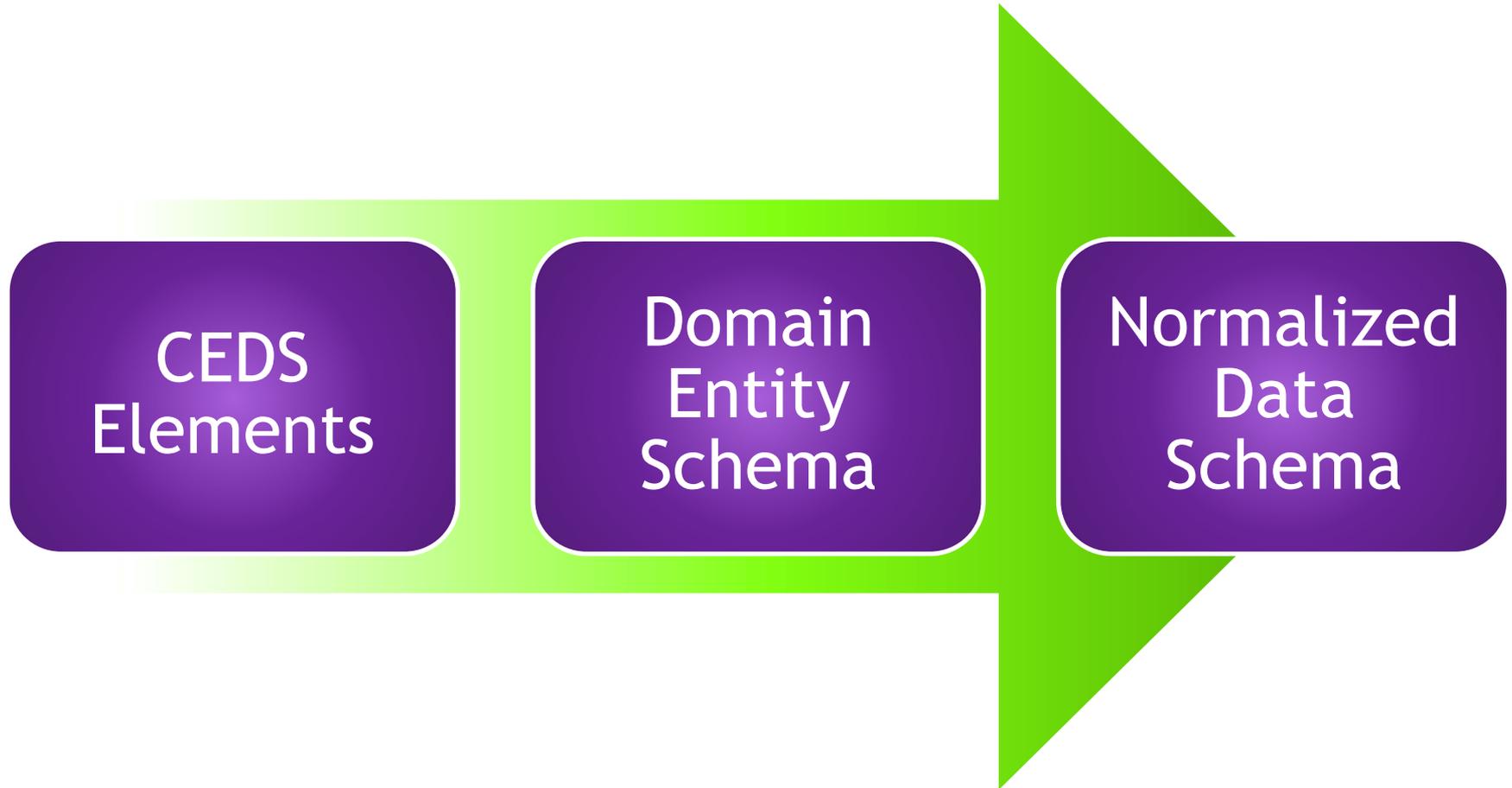
# CEDDS Domain Entity Schema (DES)

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- The DES is a hierarchy of domains, entities, attribute categories, and attributes organizing and assigning elements to specific entities.
- It is used primarily by people as an index to search, map, and organize elements.
- The DES contains mostly granular (unit level) data elements, presented in context, with a few exceptions for derived metrics to support specific use cases.
- It is not overly concerned with normalization.

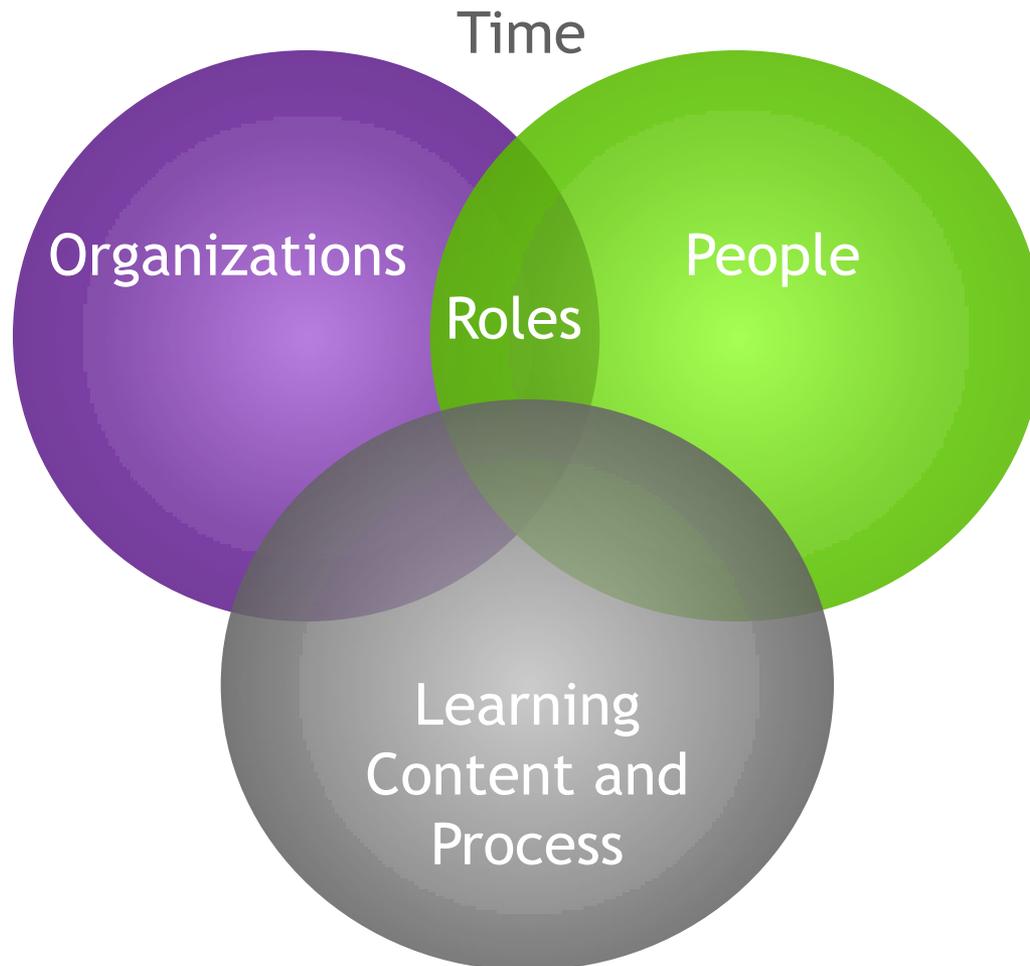
# The CEDDS Data Model Process

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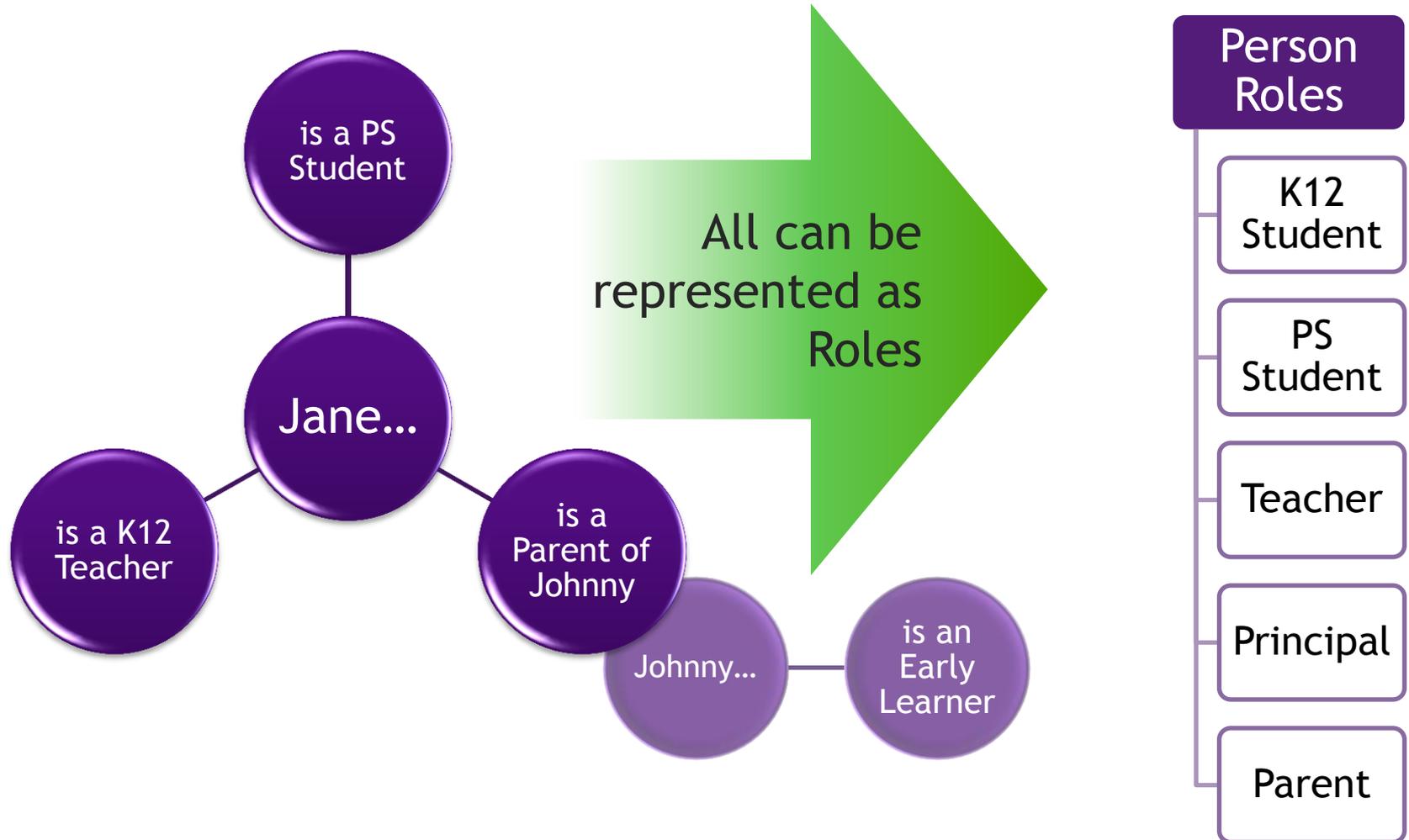


# CEDDS NDS Conceptual Model

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# Key Concept: Roles



# CEDDS Normalized Data Schema (NDS)

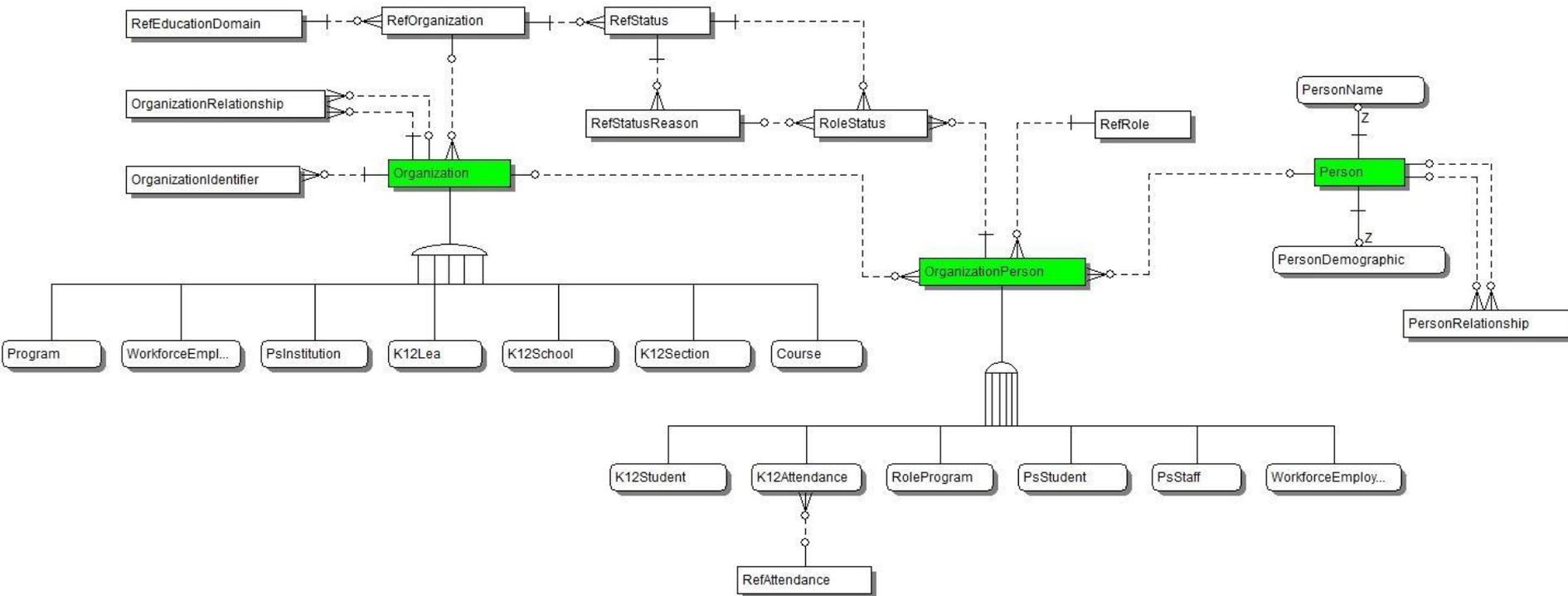
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- NDS factors the entities and attributes of the DES with **standard technical syntax** and **3rd normal form**
- The NDS Logical Model provides a standard framework for integration of P-20 data as it might exist in a well-normalized “operational data store”.
- In a P-20 data system, the NDS models the **most current** view of data available to the enterprise including **some historical data** (such as prior assessment data and enrollment records).
- A “record” is generally **added** for each Person-Org-Relationship change event in the system, with begin and end dates. A system using the model could also log changes when other attributes are **edited** to capture both change history and version history.

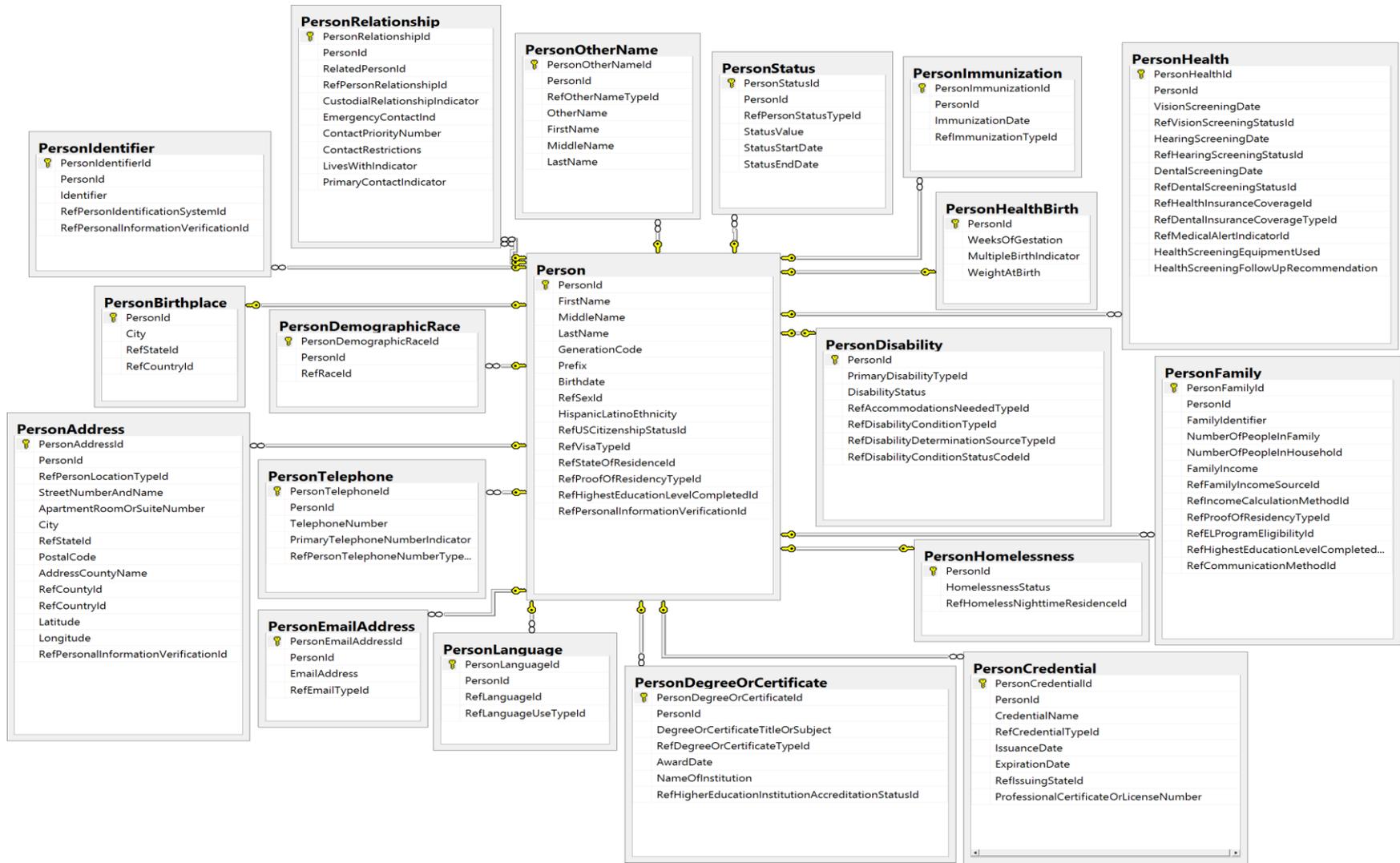
# CEDS Normalized Data Schema (NDS)

#	Type	Logic Statement
1	<b>General</b>	USED NCES will publish Common Education Data Standards (CEDDS) that will include common data elements and a logical data model.
2	<b>General</b>	The data model includes two schemas, a Domain Entity Schema (DES) and a Normalized Data Schema (NDS). The DES uses less technical syntax and organizes data elements by domain.
3	<b>General</b>	CEDDS elements are first mapped into a DES hierarchy of domain, entity, attribute category, and attribute without strong regard for normalization. The DES schema is then normalized into NDS tables based third normal rules with shared tables displayed at the top and sub-type specific organized at the bottom. An entity relationship diagram is produced with metadata published in Excel with PDF, and DDL.
4	<b>General</b>	CEDDS 2.0 will focus on data drawn from three domains of stakeholders: (1) Early Learning (EL); elementary and secondary (K12); and postsecondary (PS). CEDDS 3.0 will extend these three domains.
5	<b>Roles</b>	CEDDS 2.0 is primarily focused on standardizing educational organizations and their relationships with people and time. CEDDS 3.0 focused more on use cases that support people's relationship with learning, not so dependent on their roles in any one educational organization.
6	<b>Roles</b>	People in the NDS only have roles in relationship to a specific organization AND a designated date range.
7	<b>Roles</b>	Each role record (person-organization-relationship) can have status events that may be related to the start and/or end of role (e.g. transferred, progressed, retained, deceased). In addition, role status is used to store change events to the role such as applicant, accepted, and part -and full-time program participant.

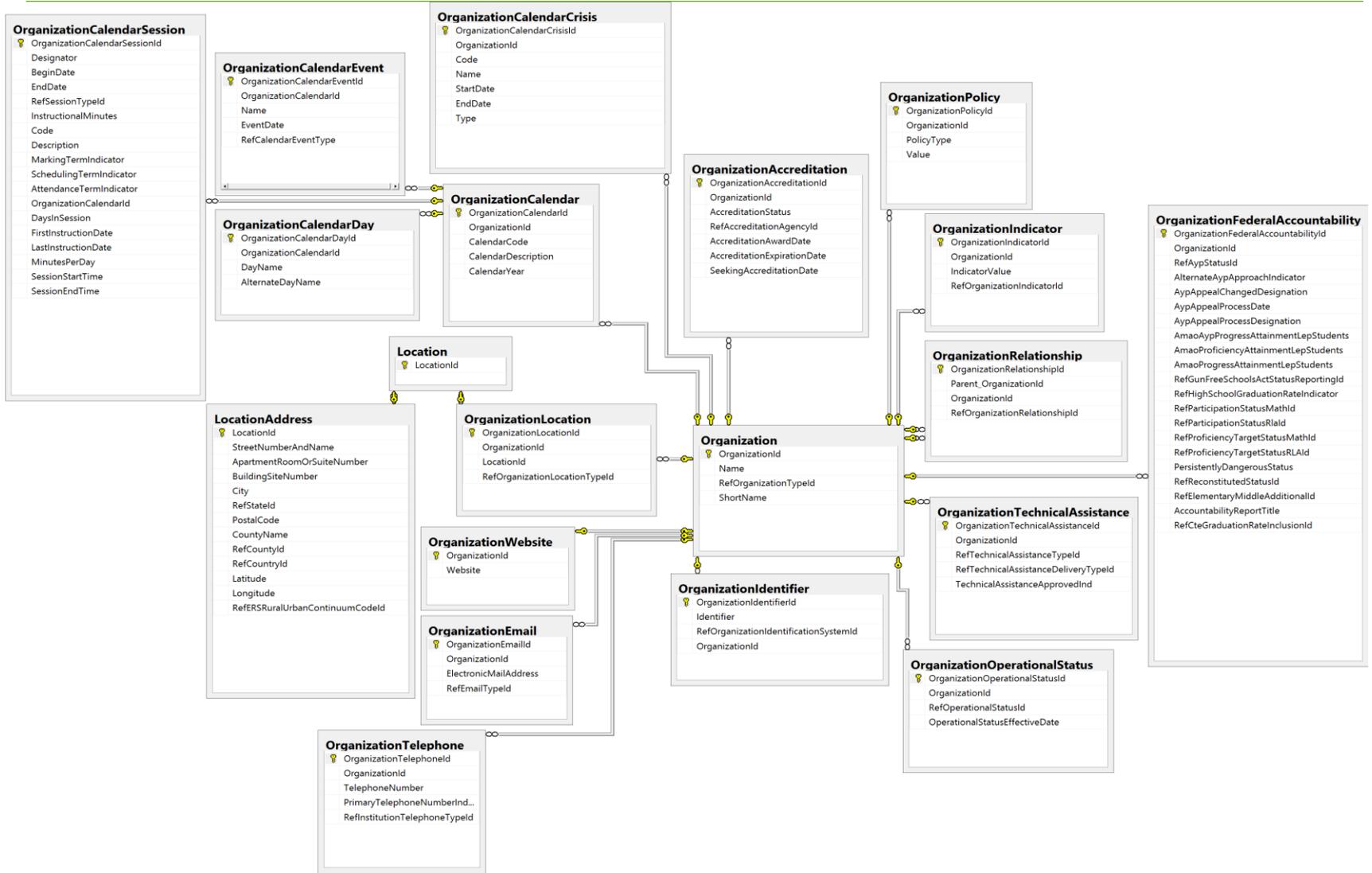
# CEDDS Logical Model (NDS): High Level



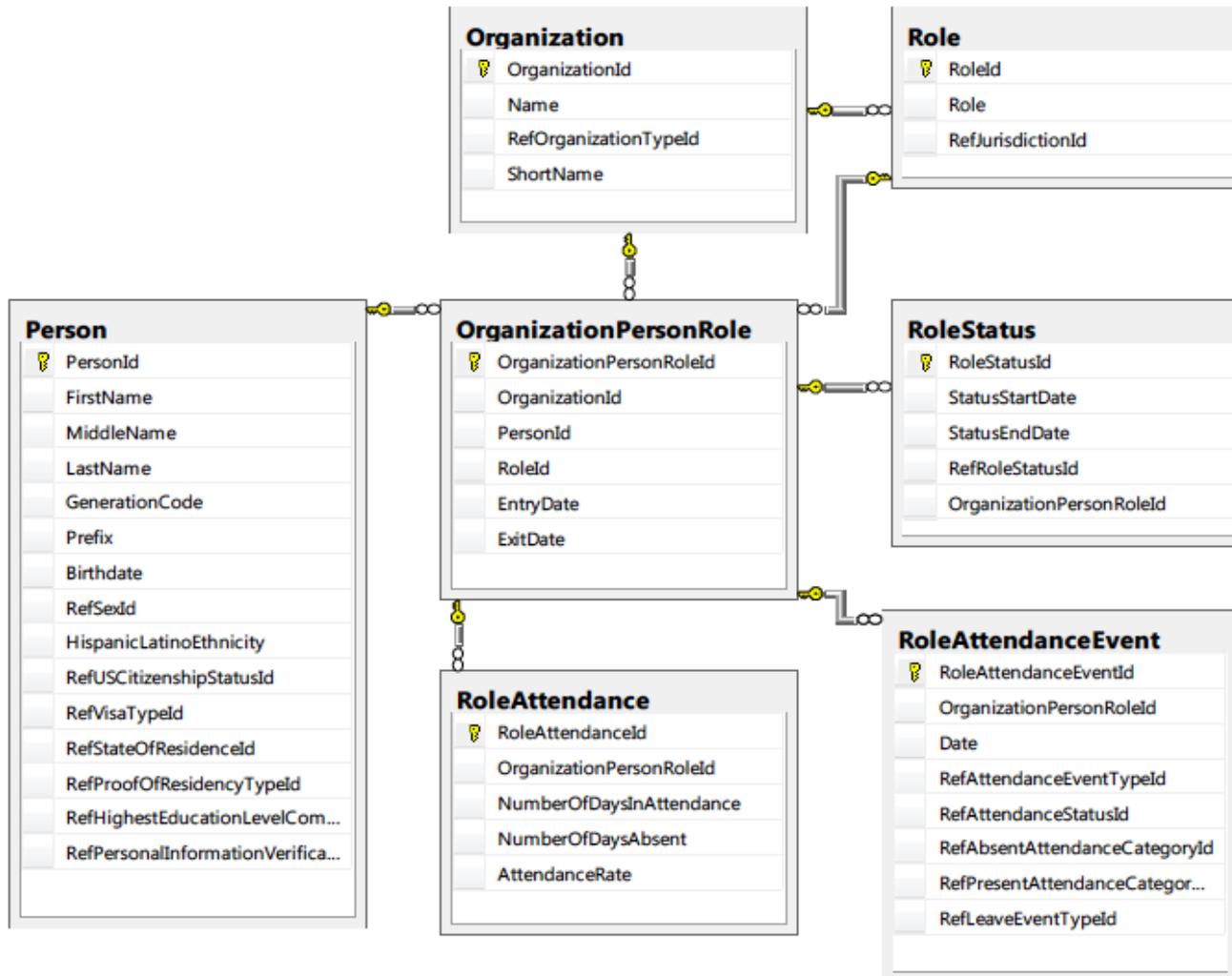
# Person(Common)



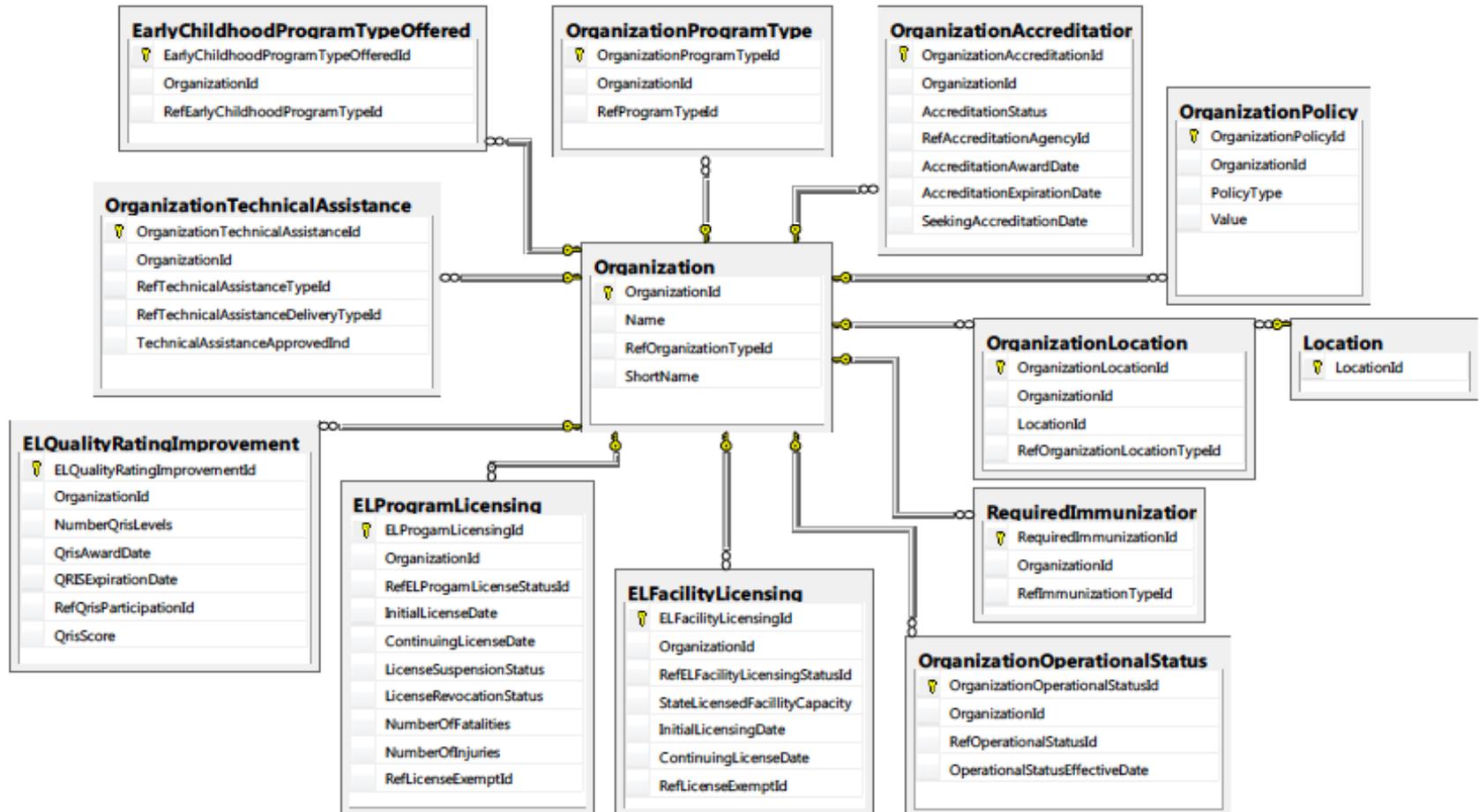
# Organization (Common)



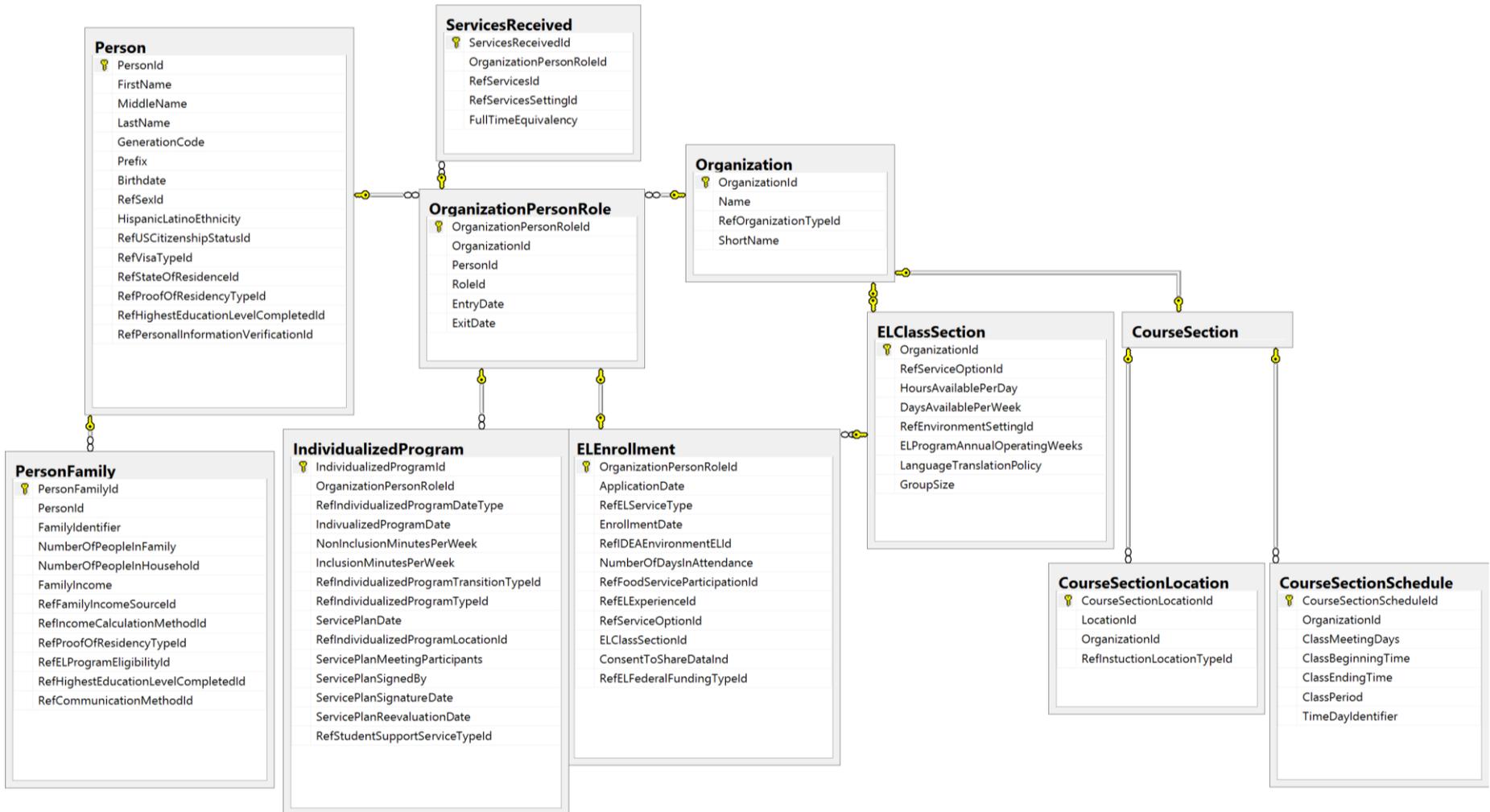
# Role (Common)



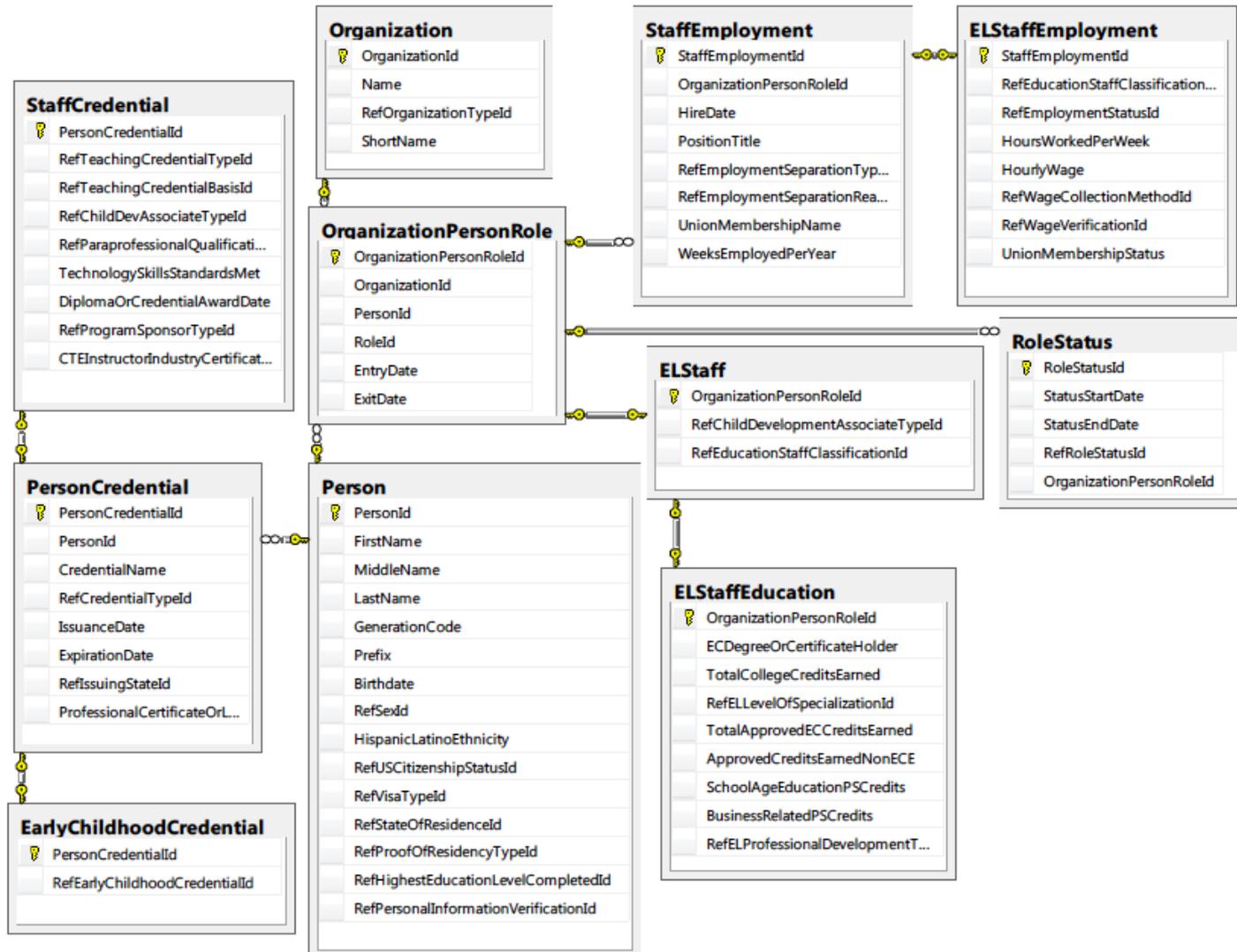
# EL Organizations



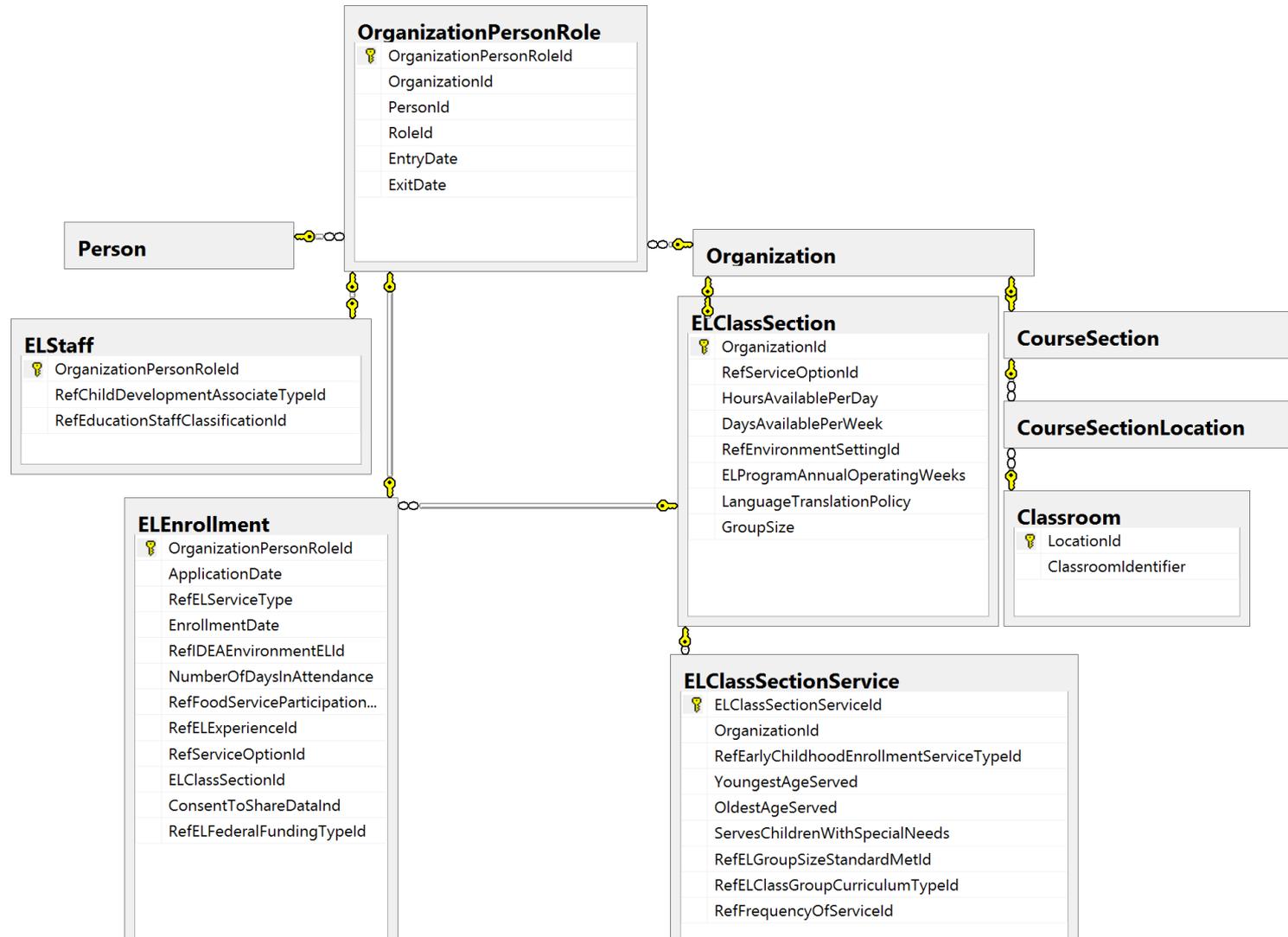
# EL Participation



# EL Staff



# EL Class/Group



# EL Professional Development

Information about a requirement that a person participate in professional development related to a specific professional role or assignment. (\*)

ProfessionalDevelopmentRequirement
ProfessionalDevelopmentRequirementId
OrganizationPersonRoleId
RequiredTrainingClockHours

ELStaffEducation
OrganizationPersonRoleId
ECDegreeOrCertificateHolder
TotalCollegeCreditsEarned
RefELLevelOfSpecializationId
TotalApprovedECCreditsEarned
ApprovedCreditsEarnedNonECE
SchoolAgeEducationPSCredits
BusinessRelatedPSCredits
RefELProfessionalDevelopmentTopicAreaId

ELStaff
OrganizationPersonRoleId
RefChildDevelopmentAssociateTypeId
RefEducationStaffClassificationId

OrganizationPersonRole
OrganizationPersonRoleId
OrganizationId
PersonId
RoleId
EntryDate
ExitDate

Person

ProfessionalDevelopmentSessionInstructor

Information about a person's participation in a professional development activity and outcomes from that participation that may be related to a Professional Development

StaffProfessionalDevelopmentActivity
StaffProfessionalDevelopmentActivityId
ProfessionalDevelopmentRequirementId
ActivityTitle
ActivityIdentifier
ActivityStartDate
ActivityCompletionDate
ScholarshipStatus
RefProfessionalDevelopmentFinancialSupportId
NumberOfCreditsEarned
RefCourseCreditUnitId
ProfessionalDevelopmentActivityId
OrganizationPersonRoleId
ProfessionalDevelopmentSessionId

An activity designed for the purpose of developing someone professionally.

ProfessionalDevelopmentActivity
ProfessionalDevelopmentActivityId
CourseId
ProfessionalDevelopmentRequirementId
Title
ActivityIdentifier
Description
Objective
ActivityCode
ApprovalCode
Cost
Credits
RefCourseCreditUnitId
ScholarshipStatus
RefProfessionalDevelopmentFinancialSupportId
PublishIndicator
RefPDAudienceTypeId
RefPDActivityApprovedForId
RefPDActivityCreditTypeId
RefPDActivityLevelId
RefPDActivityTypeId

The activity is scheduled as a session or multiple sessions to occur over multiple days.

Staff activity may be granularly defined as a person's participation in one or more Professional Development Sessions. The Professional Development Activity to which the session belongs may then be derived, i.e. Professional Development Session is part of

LearningResource
LearningStandardItemAssociation

The Professional Development Activity and/or session may be related to one or more Learning Resources and one or more professional Learning Standard

Course -- The organization of subject matter content and related learning experiences offered for the instruction of students.

Course
OrganizationId
Description
SubjectAbbreviation
SCEDSequenceOfCourse
InstructionalMinutes
RefCourseLevelCharacteristicsId
RefCourseCreditUnitId
CreditValue
RefInstructionLanguage
CertificationDescription
RefCourseApplicableEducationLevelId

The activity may be associated with a Course (e.g. postsecondary or adult education course).

Information about part or all of a Professional Development Activity scheduled for delivery within a single day.

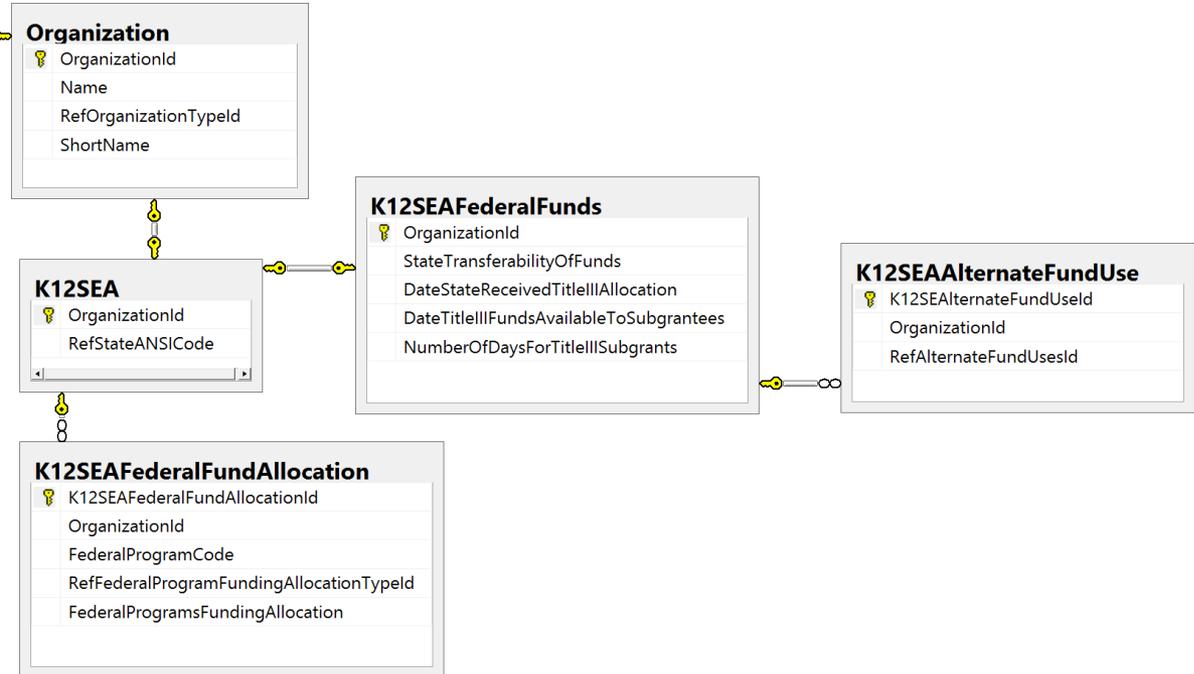
ProfessionalDevelopmentSession
ProfessionalDevelopmentSessionId
ProfessionalDevelopmentActivityId
SessionIdentifier
RefPDDeliveryMethodId
Capacity
StartDate
StartTime
EndDate
EndTime
LocationName
EvaluationMethod
EvaluationScore
ExpirationDate
RefPDSessionStatusId
RefPDInstructionalDeliveryModelId
SponsoringAgencyName
RefLanguageId
FundingSource

\*Professional Development Requirements currently reflects an early learning use case for clock-hour-based requirements but could be expanded to include elements that support requirements based on competencies (proficiency-based), credit hours, or continuing education units to support various state and local policies.

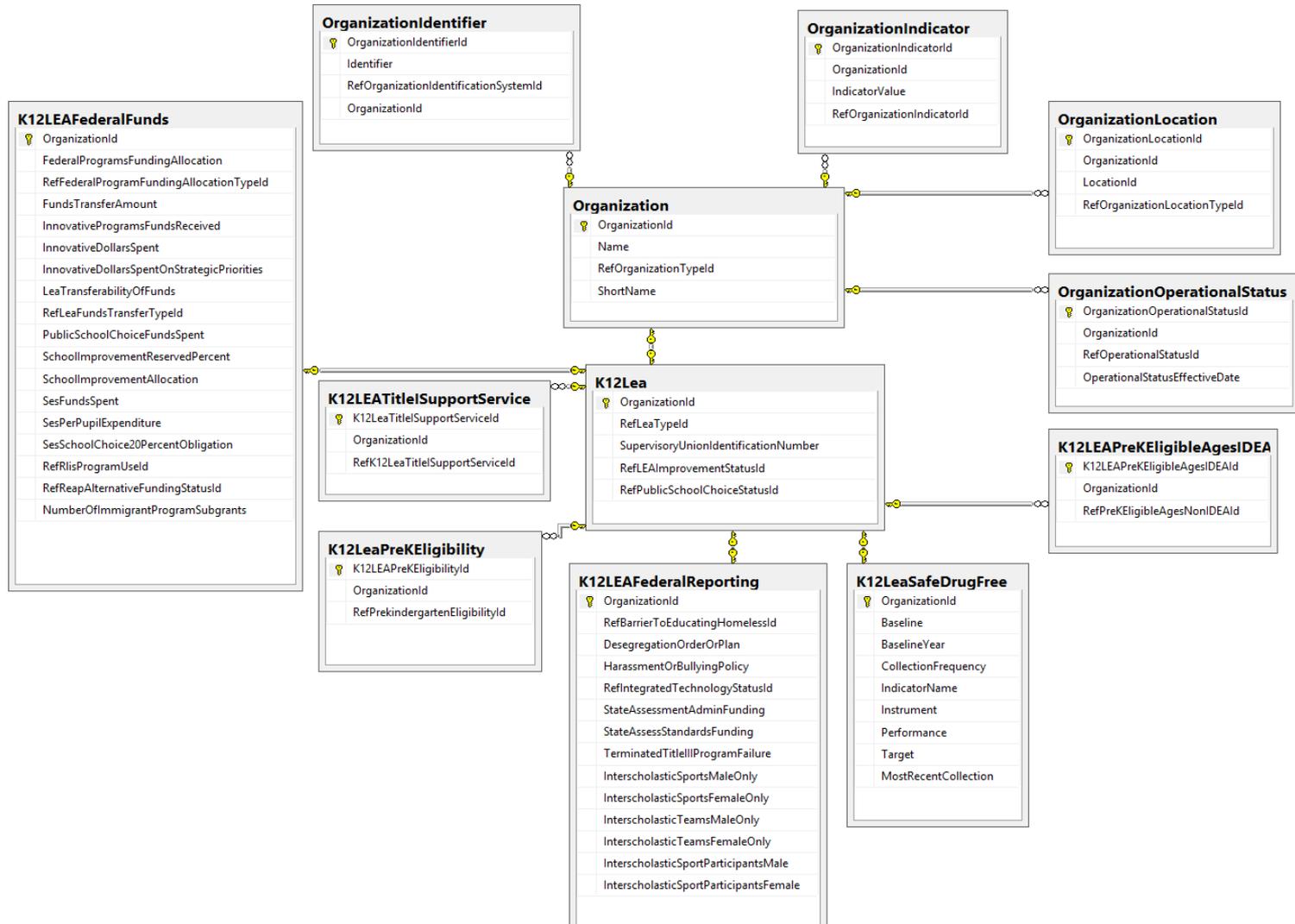
# K12 SEA

## OrganizationPersonRole

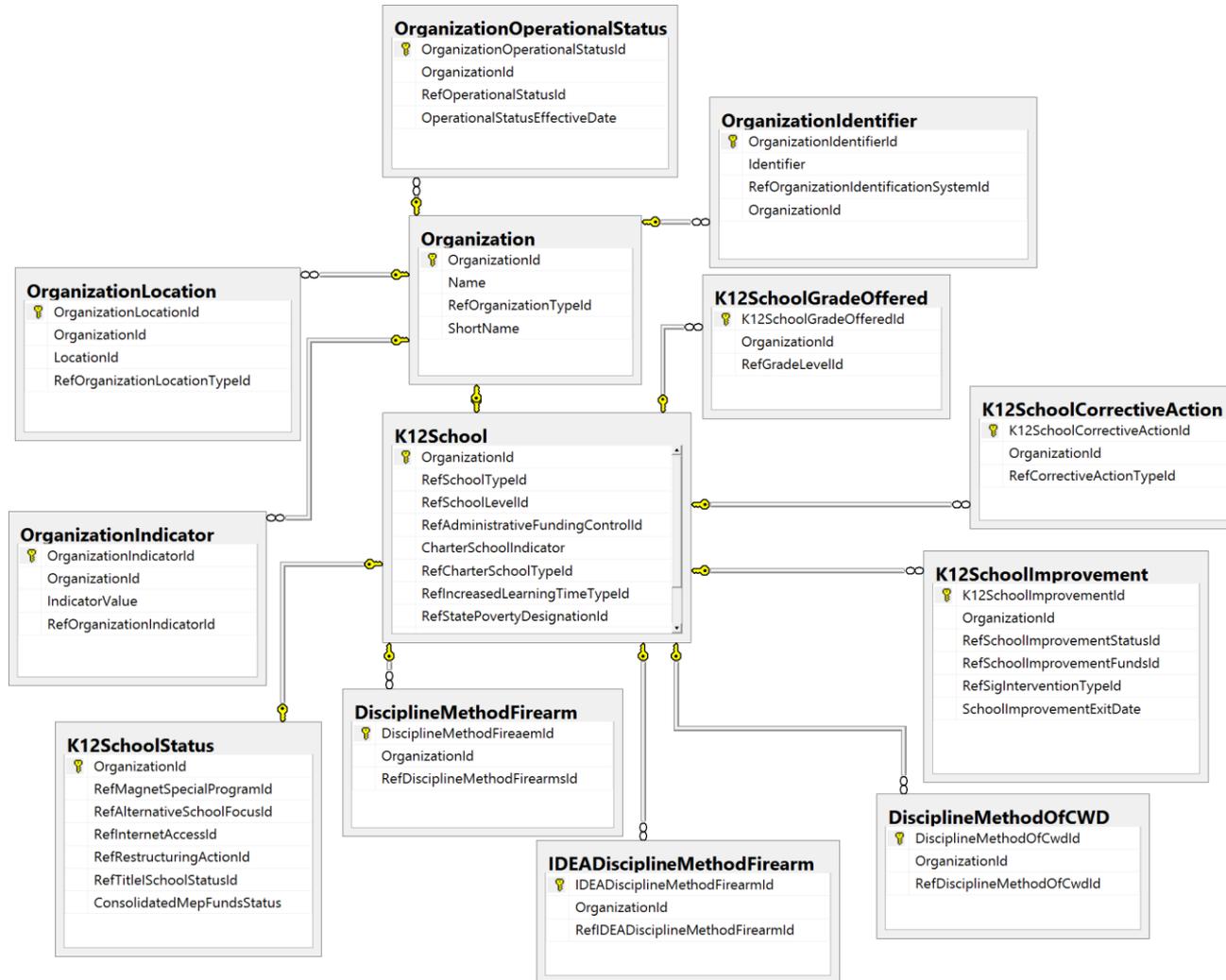
Key persons at the SEA, their titles, and contact information may be associated using OrganizationPersonRole.



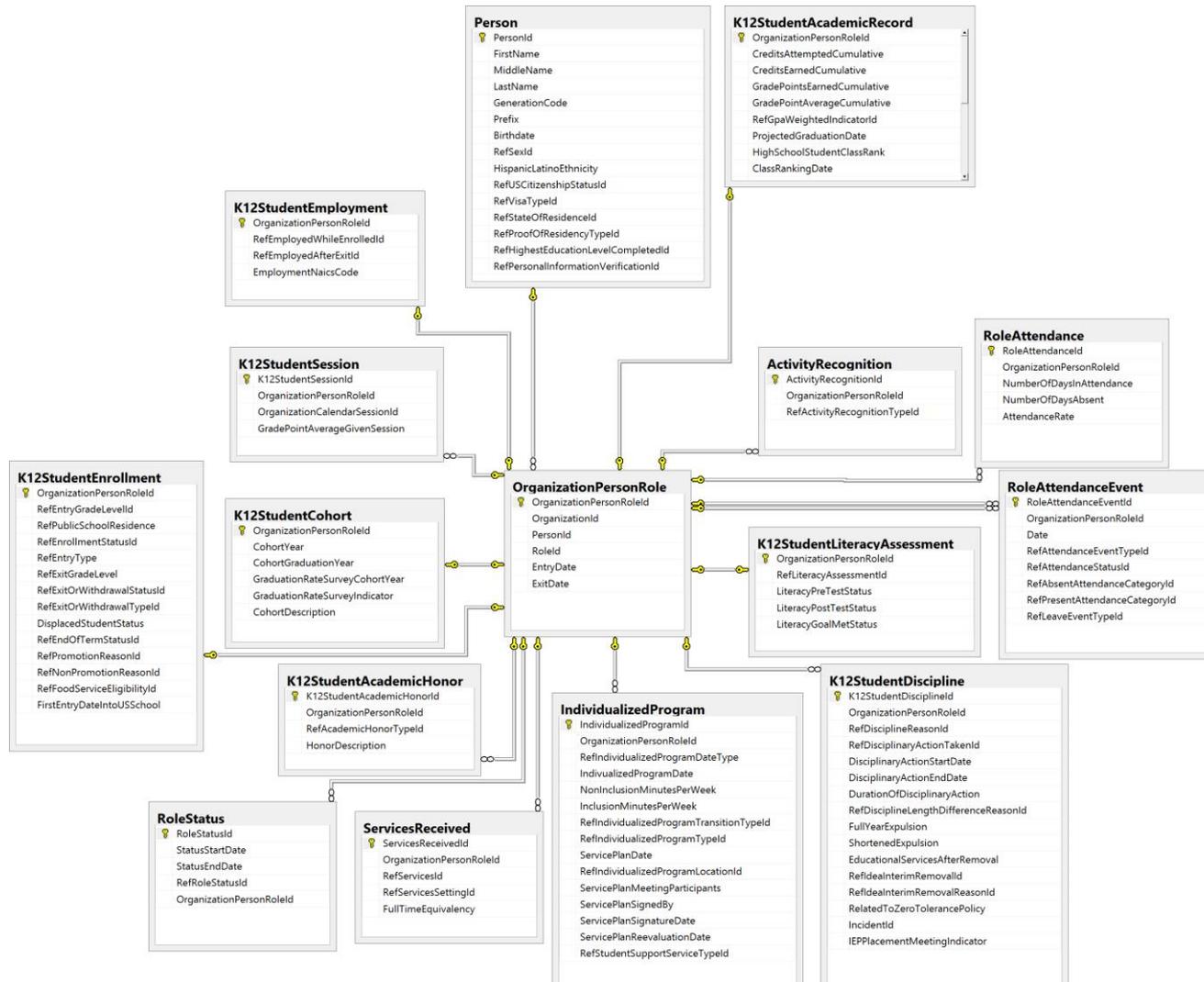
# K12 LEA



# K12 School



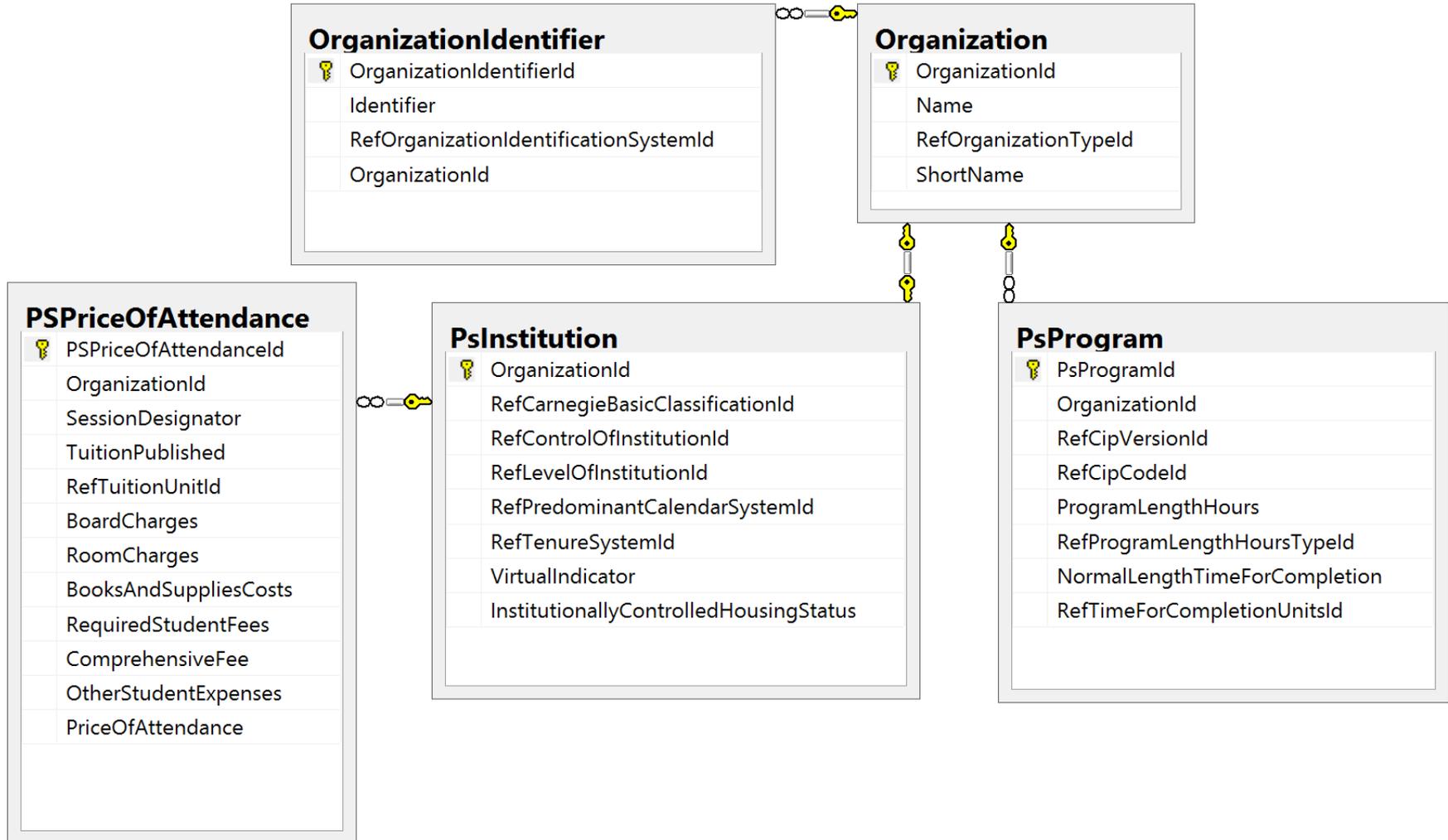
# K12 Student



# K12 Course Section



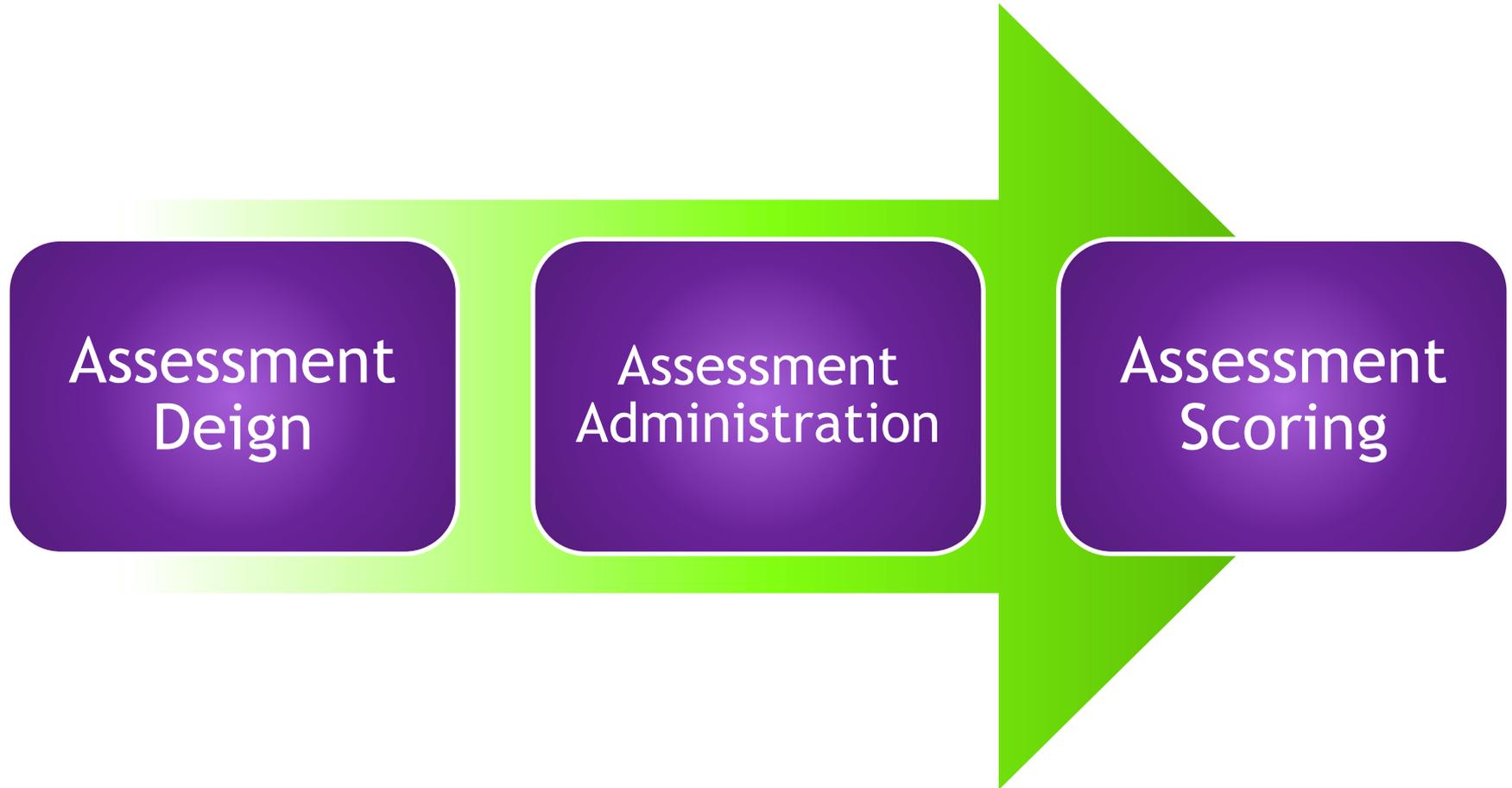
# PS Institution





# Key Concept: Assessment Processes

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# Key CEDDS Terms: Assessment

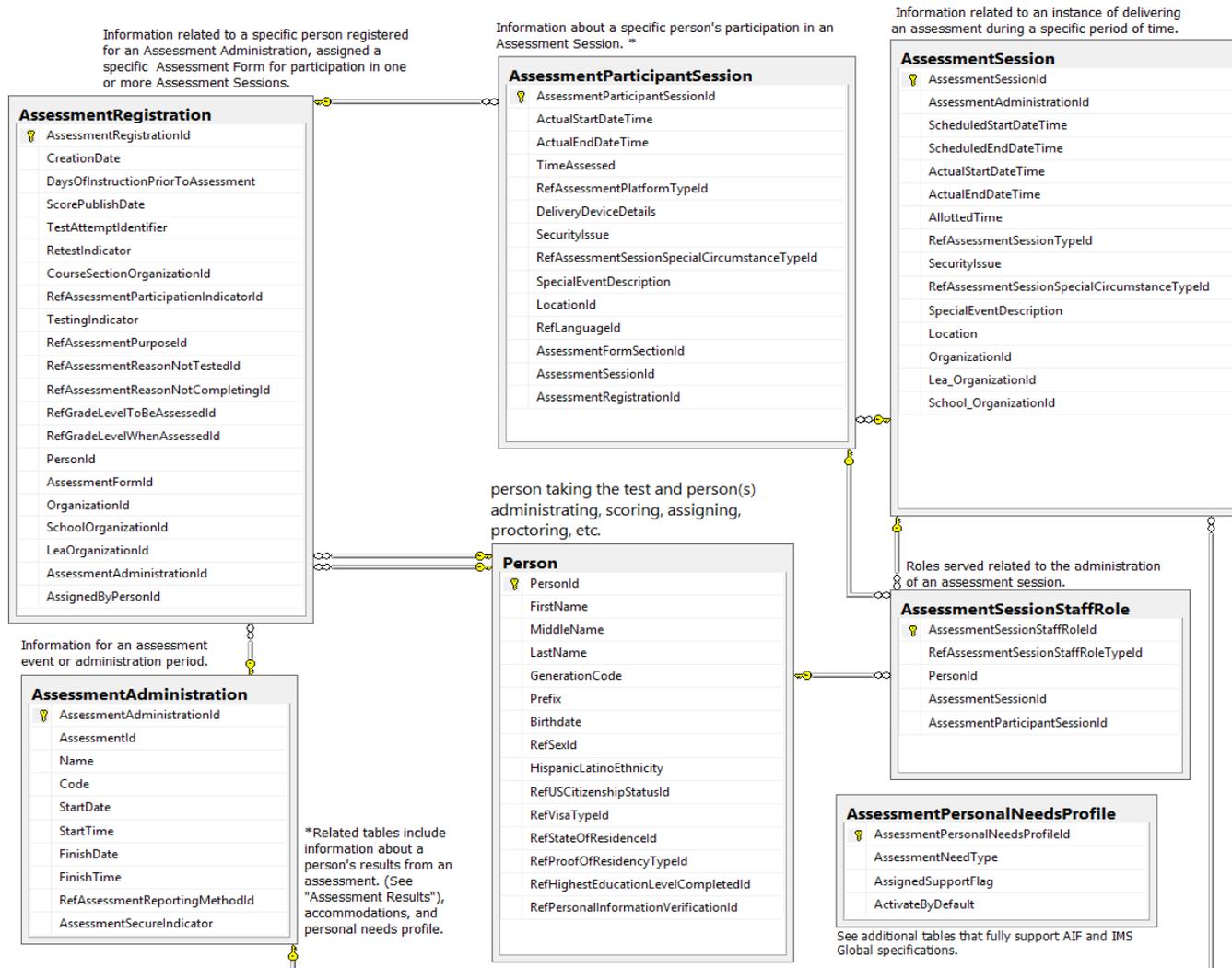
#	Attribute Category	Definitions
1	<b>Learning Standard Document</b>	A collection of learning standard items, typically arranged in a hierarchical structure or classification scheme, reflecting expectations of learner competencies within a single subject area covering one or more levels. (examples: Head Start Child Outcomes Framework, Common Core State Standards for Mathematics, Accountability Criteria for National Health Care Cluster Foundation Standards).
2	<b>Learning Standards Item</b>	Content that either describes a specific competency (learning objective) or describes a grouping of competencies within the taxonomy of a Learning Standards Document.
3	<b>Assessment Family</b>	A set of assessments with a common name, jurisdiction, or focus. (e.g. SAT, GRE, NAEP)
4	<b>Assessment Instrument</b>	An instrument used to evaluate a person with at least one form, section, and Assessment Item. (A summative assessment typically addresses a particular level, subject, and date range. A person's individual responses during the summative assessment administration are evaluated then the results are scored using one or more Assessment Sub Test Scoring Rules.)
5	<b>Assessment Form</b>	An instance of an assessment that can equate scores with another instance of that same assessment.
6	<b>Assessment Section</b>	A set of assessment items within an assessment form that contains information about administration, such as sequence, and may have content shared between multiple items such as directions for the section.
7	<b>Assessment Form Sub Test (Scoring Rule)</b>	Information about scoring based on a defined set of assessment item responses with explicit rules to produce a subtest score, which may be for the entire assessment or one aspect of evaluation.

# Key CEDDS Terms: Assessment

#	Attribute Category	Definitions
8	<b>Assessment Item</b>	A specific prompt, that defines a question or protocol for a measurable activity that triggers a response from a person used to determine whether the person has mastered a learning objective.
9	<b>Assessment Registration</b>	Information related to a specific person associated with a specific assessment form used over one or more assessment administrations.
10	<b>Assessment Administration</b>	Information related to a specific instance of delivering an assessment to a specific person during a specific time period. (The assessment administration may be done individually or as part of a group, in a physical or virtual setting.)
11	<b>Assessment Item Response</b>	Information related to the a specific response to an assessment item by the person being assessed. The entity includes the response, a score or indication that the response was correct or incorrect and other information such as response time.
12	<b>Assessment Subtest Score</b>	A score evaluating a person's results from and assessment which may be for the entire assessment or a Sub Test, calculated using a specific Score Metric and one or more assessment item responses. The entity includes the score value and information about the score, such as a diagnostic statement.
13	<b>Score Performance Level</b>	A framework for classifying student scores to determine proficiency and other levels.



# Assessment Delivery



# Assessment Results

Reference to information about the performance levels that may be assigned to an Assessment Subtest Result and specifications for selecting the performance level based on a score. Four styles are supported:

- 1) Specification of performance level by lower and upper cut score
- 2) Specification of performance level by lower cut score only
- 3) Specification of performance level without any mapping to scores
- 4) Specification of performance level by mapping to other scores

## AssessmentPerformanceLevel

### AssessmentResult\_PerformanceLevel

Reference to information for scoring an Assessment Form based on a set of Assessment Item responses with explicit rules to produce an Assessment Subtest Result, which may be for the entire Assessment Form or one aspect of evaluation based on a subset of Assessment Items.

## AssessmentSubtest

An entity that includes information about a person's results from an assessment which may be for the entire assessment or one aspect of evaluation. The scoring method is defined by the related Assessment Subtest. The entity includes the score value and information about the score, such as a diagnostic statement.

AssessmentResult	
AssessmentResultId	
ScoreValue	
RefScoreMetricTypeId	
PreliminaryIndicator	
RefAssessmentPretestOutcomeId	
NumberOfResponses	
DiagnosticStatement	
DiagnosticStatementSource	
DescriptiveFeedback	
DescriptiveFeedbackSource	
InstructionalRecommendation	
IncludedInAypCalculation	
DateUpdated	
DateCreated	
AssessmentFormSubtestId	
AssessmentRegistrationId	
RefELOutcomeMeasurementLevelId	
RefOutcomeTimePointId	

Reference to delivery data for evaluation of results.

## AssessmentParticipantSession

Reference to the assessment item design element for evaluation of the results.

### AssessmentItem

An entity with information about detailed actions taken by a learner while engaging in learning activities, such as asking for a hint when taking an online formative assessment.

### LearnerAction

LearnerAction	
LearnerActionId	
AssessmentItemResponseId	
RefLearnerActionTypeId	
Value	
Time	
Date	

An entity with information related to a specific response to an assessment item by the person being assessed. The entity includes the response, a score or indication that the response was correct or incorrect, and other information such as response time.

## AssessmentItemResponse

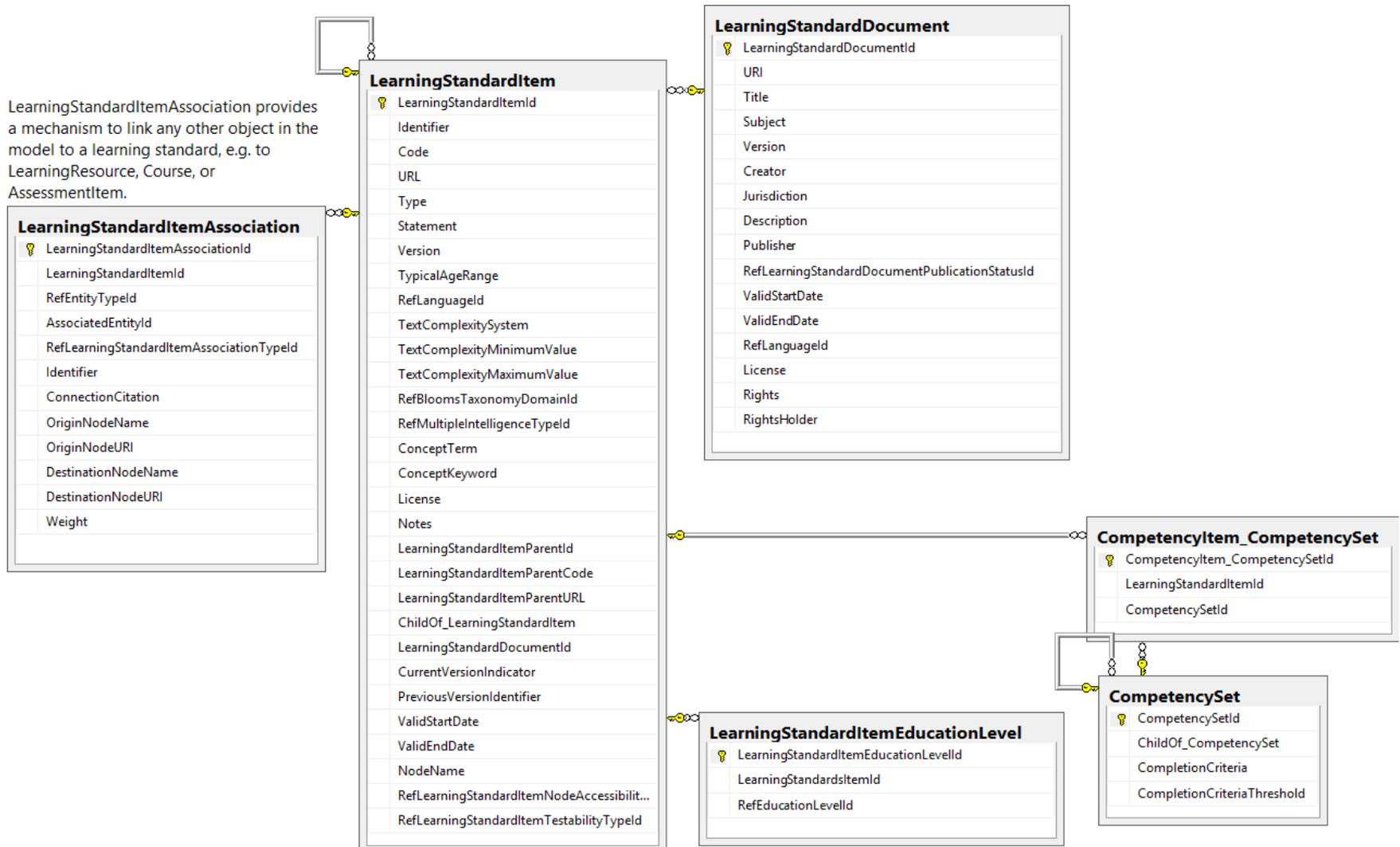
AssessmentItemResponse	
AssessmentItemResponseId	
Value	
ScoreValue	
RefAssessmentItemResponseStatusId	
RefProficiencyStatusId	
AidSetUsed	
DescriptiveFeedback	
ScaffoldingItemFlag	
HintCount	
HintIncludedAnswer	
Duration	
FirstAttemptDuration	
StartTime	
StartDate	
SecurityIssue	
AssessmentItemid	
AssessmentParticipantSessionId	
ResultXML	

## AssessmentRegistration

Results are linked via Assessment Registration and by reference to other assessment delivery information.

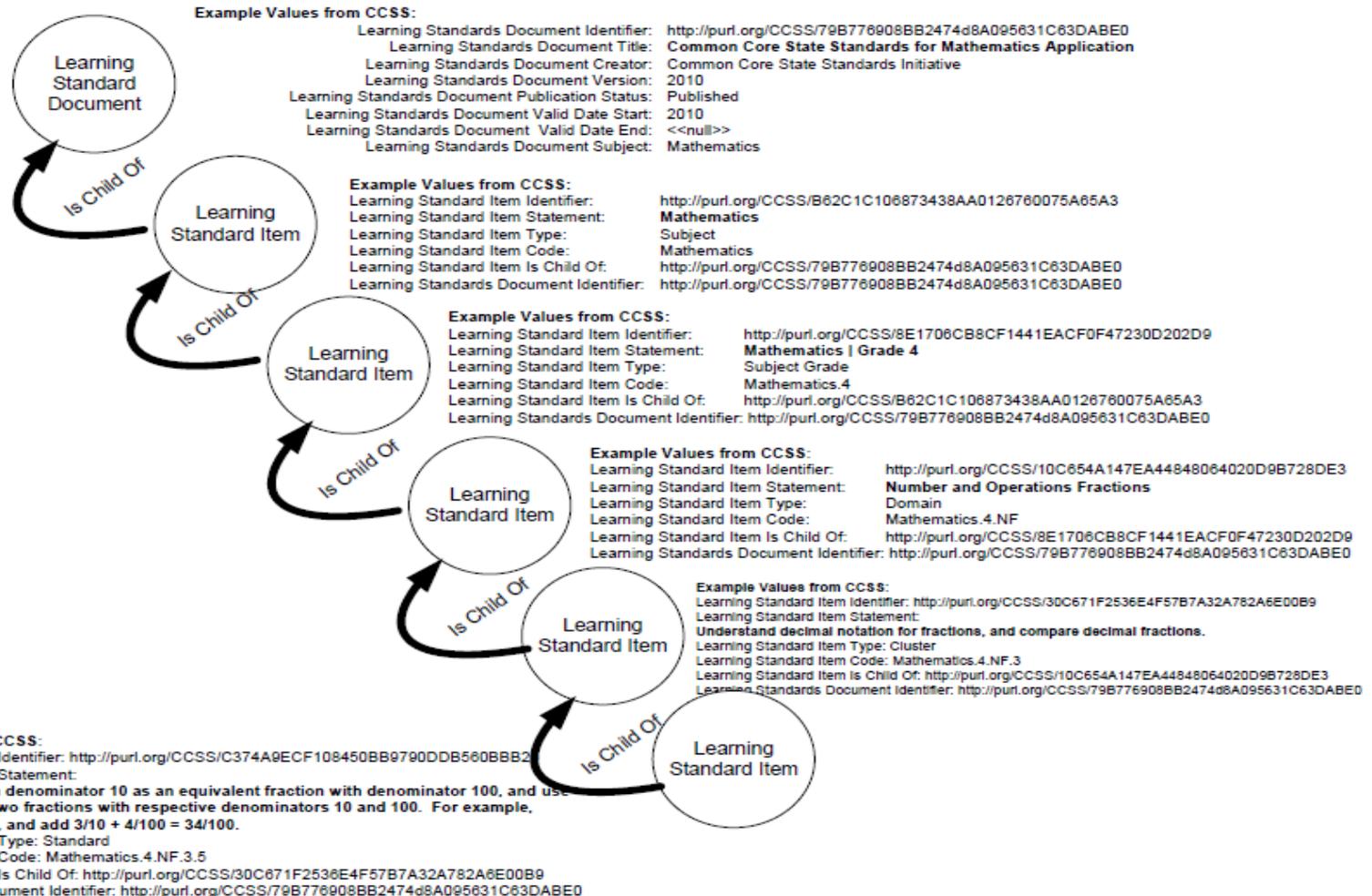
# Learning Standards

LearningStandardItemAssociation provides a mechanism to link any other object in the model to a learning standard, e.g. to LearningResource, Course, or AssessmentItem.



# Key Concept: Learning Standards

**Learning Standard Hierarchy Example**  
(Shown using CCSS Mathematics but intended to support any taxonomy of competencies)

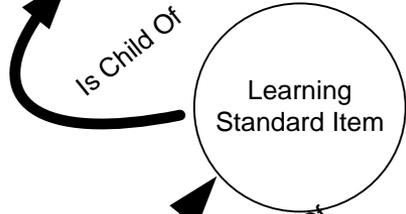


# Key Concept: Learning Standards

## Example Values from Child Development and Early Learning Framework:

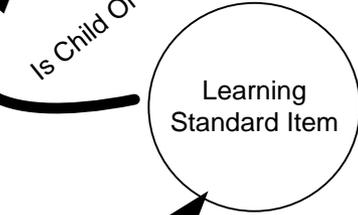
(Note: Identifier values expressed as URL/GUID are not real, shown only to illustrate proposed format.)

Learning Standards Document Identifier: <http://purl.org/HEADSTART/79B776908BB2474d8A095631C63DABE0>  
 Learning Standards Document Title: **Child Development and Early Learning Framework**  
 Learning Standards Document Creator: Head Start  
 Learning Standards Document Version: 2010  
 Learning Standards Document Publication Status: Published  
 Learning Standards Document Valid Date Start: 2010  
 Learning Standards Document Subject: Early Learning



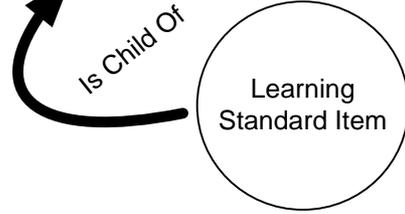
### Example Values:

Learning Standard Item Identifier: <http://purl.org/HEADSTART/B62C1C106873438AA0126760075A65A3>  
 Learning Standard Item Statement: **Mathematics Knowledge & Skills**  
 Learning Standard Item Type: **Domain**  
 Learning Standard Item Is Child Of: <http://purl.org/CCSS/79B776908BB2474d8A095631C63DABE0>  
 Learning Standards Document Identifier: <http://purl.org/CCSS/79B776908BB2474d8A095631C63DABE0>



### Example Values:

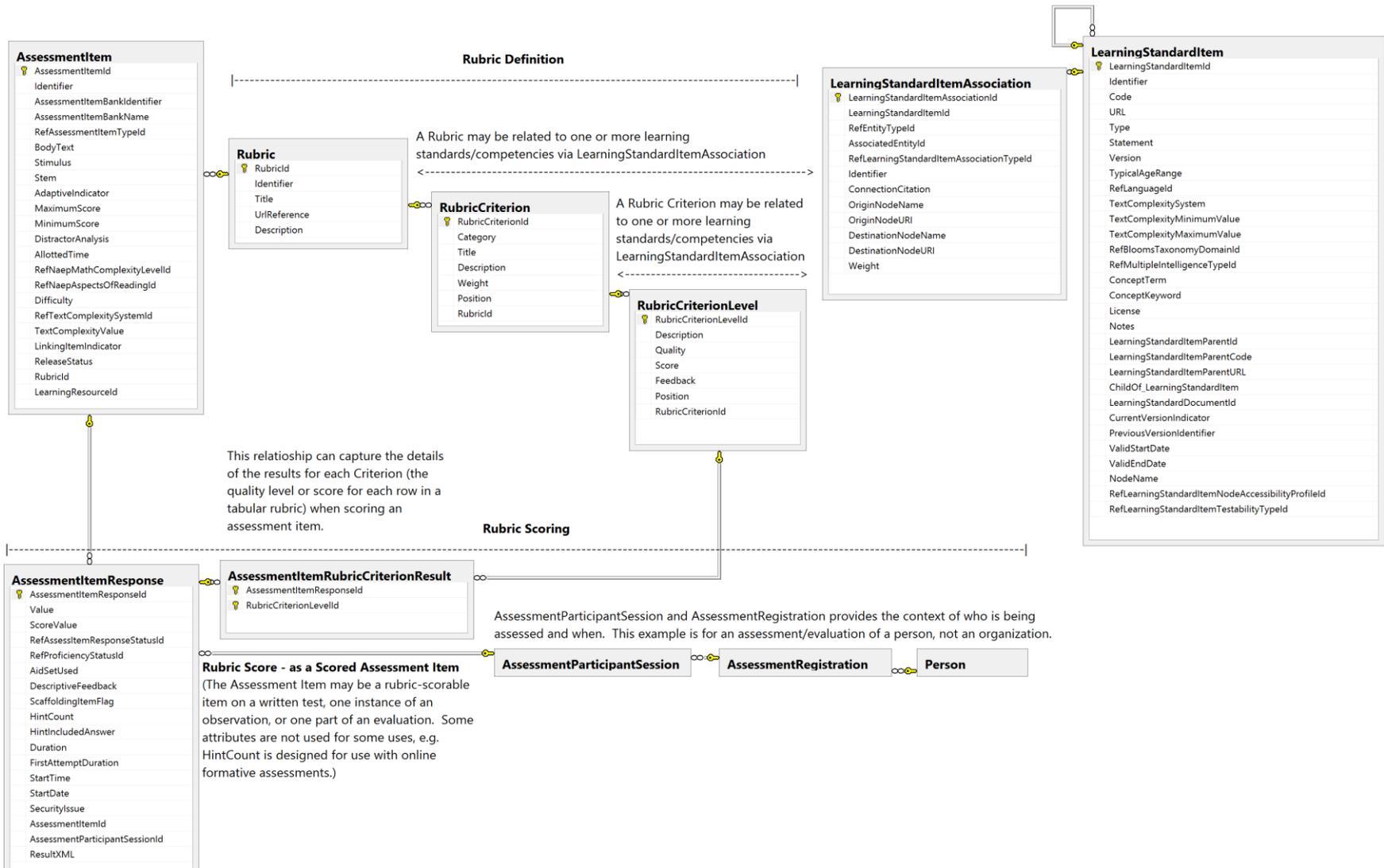
Learning Standard Item Identifier: <http://purl.org/HEADSTART/8E1706CB8CF1441EACF0F47230D202D9>  
 Learning Standard Item Statement: **Geometry and Spatial Sense**  
 Learning Standard Item Type: **Domain Element**  
 Learning Standard Item Is Child Of: <http://purl.org/CCSS/B62C1C106873438AA0126760075A65A3>  
 Learning Standards Document Identifier: <http://purl.org/CCSS/79B776908BB2474d8A095631C63DABE0>



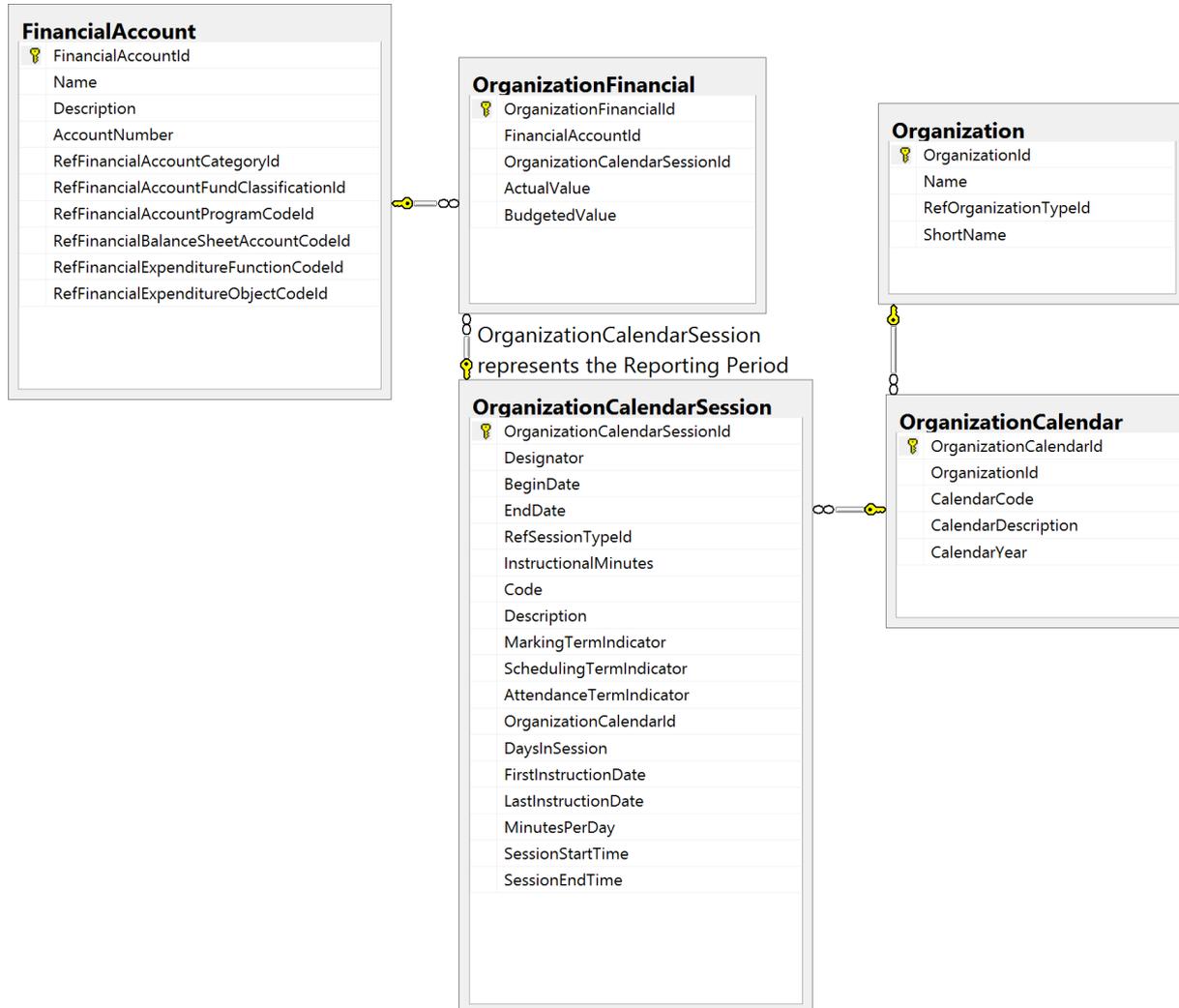
### Example Values:

Learning Standard Item Identifier: <http://purl.org/HEADSTART/8E1706CB8CF1441EACF0F47230D202D9>  
 Learning Standard Item Statement: **Recognizes and names common shapes, their parts, and attributes.**  
 Learning Standard Item Type: **Example**  
 Learning Standard Item Is Child Of: <http://purl.org/CCSS/B62C1C106873438AA0126760075A65A3>  
 Learning Standards Document Identifier: <http://purl.org/CCSS/79B776908BB2474d8A095631C63DABE0>

# Rubrics



# Financial Reporting



# Workforce

