Entity Sets & Attributes

Entity	Primary Key	Attributes
Department	department_id	name, abbreviation
Person	person_id	name, email, role
Research_Group	group_id	name, focus
Project	project_id	title, description, start_date, end_date, status
Experiment	experiment_id	title, theory, start_date, end_date, status
Task	task_id	title, theory, status, due_date, completed_date
Literature	lit_id	title, authors, year, journal, doi, url

Relationships Between Entities

Relationship	Entities Connected	Type	Relationship Attributes
person_dept	Person ↔ Department	1:M	—
research_dept	Research_Group ↔ Department	1:M	—
leads	Person ↔ Research_Group	1:1 (optional leadership)	—
person_group	Person ↔ Research_Group	M:M	role, join_date
group_project	Research_Group ↔ Project	1:M	—
project_member	Person ↔ Project	M:M	role, join_date
project_tasks	Project ↔ Task	1:M	—
task_assignment	Person ↔ Task	M:M	assigned_date
project_expt	Project ↔ Experiment	1:M	—
project_literature	Project ↔ Literature	M:M	—
expt_literature	Experiment ↔ Literature	M:M	—

Design Rationale

This database is intended to organize research activity within academic or institutional research groups. Departments act as the highest organizational level and include both people and research groups. People represent researchers, faculty, or students who may be involved in multiple groups and projects at the same time. Research groups oversee projects, usually have a designated lead, and support collaboration among members. Projects serve as the central unit of research activity and connect people, experiments, tasks, and relevant literature. Experiments represent specific investigative components tied directly to a project, so they're treated as dependent entities rather than standalone ones. Tasks capture the day-to-day work within projects and can be assigned to multiple people, allowing responsibilities to be shared flexibly. Literature is stored separately so research sources can be reused across projects or experiments without duplication.

Our design was chosen to reflect how research teams actually work while keeping the database organized and practical to use. Separating departments, groups, and people maintains a clear structure but still allows collaboration across projects. Making projects the central entity helps connect experiments, tasks, membership, and literature in a way that feels intuitive and avoids repeating information. Keeping literature independent makes it easier to reference the same sources across multiple research efforts. Overall, each part of the design supports collaboration, clear project tracking, flexible participation, and easier access to research information while keeping the data organized and consistent.