

01. Create the students and grades collections and insert the sample documents into both Collections.

The screenshot shows the MongoDB Compass interface for a database named 'SchoolDB'. Two collections are listed: 'grades' and 'students'. The 'grades' collection has 20 documents, an average document size of 99.00 B, and a total index size of 20.48 kB. The 'students' collection has 10 documents, an average document size of 145.00 B, and a total index size of 20.48 kB.

Collection	Storage size	Documents	Avg. document size	Indexes	Total index size
grades	20.48 kB	20	99.00 B	1	20.48 kB
students	20.48 kB	10	145.00 B	1	20.48 kB

02. Show both collections in table view.

The screenshot shows the 'students' collection in table view. The table has 10 rows, each representing a student document. The columns are: _id, name, enrollmentYear, major, email, and gender. Each row includes a small icon for document actions.

	_id	name	enrollmentYear	major	email	gender
1	ObjectId('64b1fcd1f4a13a0...')	"Alice Johnson"	2021	"Computer Science"	"alice.johnson@example.co..."	"Female"
2	ObjectId('64b1fcd1f4a13a0...')	"Bob Smith"	2020	"Mathematics"	"bob.smith@example.com"	"Male"
3	ObjectId('64b1fcd1f4a13a0...')	"Clara Lee"	2022	"Physics"	"clara.lee@example.com"	"Female"
4	ObjectId('64b1fcd1f4a13a0...')	"Daniel Kim"	2021	"Engineering"	"daniel.kim@example.com"	"Male"
5	ObjectId('64b1fcd1f4a13a0...')	"Eva Chen"	2020	"Biology"	"eva.chen@example.com"	"Female"
6	ObjectId('64b1fcd1f4a13a0...')	"Frank Wright"	2019	"Chemistry"	"frank.wright@example.com"	"Male"
7	ObjectId('64b1fcd1f4a13a0...')	"Grace Liu"	2022	"Economics"	"grace.liu@example.com"	"Female"
8	ObjectId('64b1fcd1f4a13a0...')	"Henry Davis"	2021	"Philosophy"	"henry.davis@example.com"	"Male"
9	ObjectId('64b1fcd1f4a13a0...')	"Ivy Zhang"	2020	"Statistics"	"ivy.zhang@example.com"	"Female"
10	ObjectId('64b1fcd1f4a13a0...')	"Jack Lee"	2023	"Business"	"jack.lee@example.com"	"Male"

The screenshot shows the 'grades' collection in table view. The table has 17 rows, each representing a grade document. The columns are: _id, subject, score, term, and studentId. Each row includes a small icon for document actions.

	_id	subject	score	term	studentId
1	ObjectId('6826ef09e32a3fe...')	"Mathematics"	85	"Fall 2022"	ObjectId('64b1fcd1f4a13a0...')
2	ObjectId('6826ef09e32a3fe...')	"English"	90	"Fall 2022"	ObjectId('64b1fcd1f4a13a0...')
3	ObjectId('6826ef09e32a3fe...')	"Mathematics"	75	"Spring 2022"	ObjectId('64b1fcd1f4a13a0...')
4	ObjectId('6826ef09e32a3fe...')	"Statistics"	80	"Fall 2022"	ObjectId('64b1fcd1f4a13a0...')
5	ObjectId('6826ef09e32a3fe...')	"Physics"	92	"Fall 2022"	ObjectId('64b1fcd1f4a13a0...')
6	ObjectId('6826ef09e32a3fe...')	"Mathematics"	86	"Spring 2023"	ObjectId('64b1fcd1f4a13a0...')
7	ObjectId('6826ef09e32a3fe...')	"Engineering"	89	"Fall 2021"	ObjectId('64b1fcd1f4a13a0...')
8	ObjectId('6826ef09e32a3fe...')	"Mathematics"	84	"Spring 2022"	ObjectId('64b1fcd1f4a13a0...')
9	ObjectId('6826ef09e32a3fe...')	"Biology"	78	"Spring 2021"	ObjectId('64b1fcd1f4a13a0...')
10	ObjectId('6826ef09e32a3fe...')	"Chemistry"	82	"Fall 2021"	ObjectId('64b1fcd1f4a13a0...')
11	ObjectId('6826ef09e32a3fe...')	"Chemistry"	88	"Fall 2021"	ObjectId('64b1fcd1f4a13a0...')
12	ObjectId('6826ef09e32a3fe...')	"Physics"	79	"Spring 2022"	ObjectId('64b1fcd1f4a13a0...')
13	ObjectId('6826ef09e32a3fe...')	"Economics"	83	"Spring 2023"	ObjectId('64b1fcd1f4a13a0...')
14	ObjectId('6826ef09e32a3fe...')	"English"	89	"Fall 2022"	ObjectId('64b1fcd1f4a13a0...')
15	ObjectId('6826ef09e32a3fe...')	"Philosophy"	91	"Fall 2022"	ObjectId('64b1fcd1f4a13a0...')
16	ObjectId('6826ef09e32a3fe...')	"History"	77	"Spring 2023"	ObjectId('64b1fcd1f4a13a0...')
17	ObjectId('6826ef09e32a3fe...')	"Statistics"	79	"Spring 2022"	ObjectId('64b1fcd1f4a13a0...')

03. Find the female students and only display their name, age and gender.

```
>_MONGOSH
> use SchoolDB
< switched to db SchoolDB
> db.students.find({ gender: "Female" }, { name: 1, age: 1, gender: 1 });
< {
  _id: ObjectId('64b1fcd1f4a13a001e3d41a1'),
  name: 'Alice Johnson',
  gender: 'Female',
  age: 20
}
{
  _id: ObjectId('64b1fcd1f4a13a001e3d41a3'),
  name: 'Clara Lee',
  gender: 'Female',
  age: 19
}
{
  _id: ObjectId('64b1fcd1f4a13a001e3d41a5'),
  name: 'Eva Chen',
  gender: 'Female',
  age: 23
}
{
  _id: ObjectId('64b1fcd1f4a13a001e3d41a7'),
  name: 'Grace Liu',
  gender: 'Female',
  age: 20
}
```

04. Find the students who are younger than 22 and enrolled after 2020.

```
>_MONGOSH
> db.students.find({ age: { $lt: 22 }, enrollmentYear: { $gt: 2020 } });
< {
  _id: ObjectId('64b1fcd1f4a13a001e3d41a1'),
  name: 'Alice Johnson',
  enrollmentYear: 2021,
  major: 'Computer Science',
  email: 'alice.johnson@example.com',
  gender: 'Female',
  age: 20
}
{
  _id: ObjectId('64b1fcd1f4a13a001e3d41a3'),
  name: 'Clara Lee',
  enrollmentYear: 2022,
  major: 'Physics',
  email: 'clara.lee@example.com',
  gender: 'Female',
  age: 19
}
{
  _id: ObjectId('64b1fcd1f4a13a001e3d41a4'),
  name: 'Daniel Kim',
  enrollmentYear: 2021,
  major: 'Engineering',
  email: 'daniel.kim@example.com',
  gender: 'Male',
  age: 21
}
```

05. Find all grades for "Alice Johnson".

```
> db.grades.find({ studentId: ObjectId("64b1fcd1f4a13a001e3d41a1") });
< {
  _id: ObjectId('6826ef09e32a3feb38530fbd'),
  subject: 'Mathematics',
  score: 85,
  term: 'Fall 2022',
  studentId: ObjectId('64b1fcd1f4a13a001e3d41a1')
}
{
  _id: ObjectId('6826ef09e32a3feb38530fbe'),
  subject: 'English',
  score: 90,
  term: 'Fall 2022',
  studentId: ObjectId('64b1fcd1f4a13a001e3d41a1')
}
```

06. Find how many students followed the subject "Mathematics".

```
> db.grades.find({ subject: "Mathematics" }).count();
< 4
```

07. Find all students with grades in the term "Fall 2022".

```
> _MONGOSH
studentId: ObjectId('64b1fcd1f4a13a001e3d41a1')
}
{
  _id: ObjectId('6826ef09e32a3feb38530fbe'),
  subject: 'English',
  score: 90,
  term: 'Fall 2022',
  studentId: ObjectId('64b1fcd1f4a13a001e3d41a1')
}
> db.grades.find({ subject: "Mathematics" }).count();
< 4
> db.grades.find({ term: "Fall 2022" });
< {
  _id: ObjectId('6826ef09e32a3feb38530fbd'),
  subject: 'Mathematics',
  score: 85,
  term: 'Fall 2022',
  studentId: ObjectId('64b1fcd1f4a13a001e3d41a1')
}
{
  _id: ObjectId('6826ef09e32a3feb38530fbe'),
  subject: 'English',
  score: 90,
  term: 'Fall 2022',
  studentId: ObjectId('64b1fcd1f4a13a001e3d41a1')
}
```