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Lesson Preparation

For each lesson in the SQL course, read and explain the lesson objectives in "What Will I Learn?" and establish relevance by engaging students in the "Why Learn It" content. Each section in the SQL curriculum is divided into five lessons. In Lesson 1 of each section, under the content heading "Try It/Solve It," is a link for students to copy the study guide and vocabulary worksheets for that section. These worksheets are excellent resources to use with students for quiz review. They have been designed to focus on the key points and terms tested in each quiz.

Introduce this lesson by giving an overview the Oracle 10g Database Environment. Explain the importance of this product from the student's perspective. Explain that in this course, students will be users and developers. They will use the Oracle 10g Database Environment in the following ways:

They will use one of its features -- HTML DB -- to formulate SQL queries and create tables. They will use the Oracle Application Builder software to create a database application. They will understand why Oracle is a leader in the development and implementation of software that implements "grid computing" -- that's the g in 10g.
Oracle's 10g database management system gives businesses the ability to coordinate and share computing, application, data, storage, or network resources across dynamic and geographically dispersed organizations and in turn save time, resources, and money.

For more information, use Internet search keywords "grid computing," "Oracle 10g," or Oracle grid computing information.

**What to Watch For**

Much of the information on technical websites is difficult for students to synthesize. Focus on more easily understood articles.

Students may not understand the complexities of business. Try to relate the terms and concepts to real-world examples. See [http://www.oracle.com/broadband/](http://www.oracle.com/broadband/) for sample scenarios of how Oracle has helped businesses solve information problems.

**Connections**

Now that students are familiar with the Oracle Corporation, have them research Oracle's presence in the stock market.

What is the history of Oracle's stock, what is it's current price, what were Oracle's earnings over the last year? Students could each "buy" 1,000 shares of stock and each week graph its activity and calculate their earnings per share.
What Will I Learn?

In this lesson, you will learn to:

- Explain the features and benefits that the Oracle 10g Database Environment provides for businesses.
- Locate information about Oracle Corporation and its products and services.
- Relate the steps in the system development life cycle to the development and design of the Oracle 10g Database product and the data-modelling process.
Why Learn It?

Discuss the camera graphic and the evolution of the camera and its recent incorporation into cell phones. The cell phone, in turn, has evolved to be a PDA organizer, Internet browser, and email application.

Ask students the following questions.
What changes are being made in automobiles? Global Positioning Systems (GPS), DVD players, cars that don't need servicing until 100,000 miles, and hybrid cars that use electricity and gas.
What changes have been made in wrist watches? Download information wirelessly from the Internet.
Reinforce the concept that industry leaders like Oracle will always seek to develop new products to make work easier and more efficient. Keeping up with the speed of technology is a challenge for everyone.
Read and paraphrase the article "The Making of Oracle Database 10g" by Barbara Assidi. Because much of the information about the Oracle 10g product is very technical, read aloud and paraphrase the article with the students. Draw relationships between the process students just experienced in data modeling and the development of Oracle 10g.

**Specifically, the article notes the following:**
- "The planning phase commenced about two years before coding began."
- "The biggest challenge isn't coming up with great ideas to build into the database -- it's narrowing them down."
- "Writing the code that comprises the Oracle database is a disciplined activity that begins with the creation of a Functional Specification Document -- a document that provides details about each new feature of the database, complete with architectural diagrams."
- "We had checkpoint meetings every six weeks to make sure the development managers were on top of the project and on schedule," she says.
- "Things don't always go as planned, and these meetings give us a chance to anticipate problems and respond quickly to events."
- "Early on, we developed a core document that distilled the myriad features of the release into a statement of the release's key messages."
- "We spent a lot of time on the language."

Briefly explain the components of the Oracle 10g graphic. Point out how one of the features, HTML DB, will be used in the SQL course.
Try It / Solve It

Possible answer:

**Compare:** The power company has a power grid that many local companies share; the phone company shares its phone lines for more that just calls (e.g., the Internet).

**Contrast:** The power-company equipment grid needs updating and modernizing in many countries. Oracle is constantly updating its products. The basic phone access requires a dial-up/ring/answer process that has changed little over the past century. At the same time, database-access technology has undergone dramatic changes (e.g., business online transactions).
Try It / Solve It

Explain the steps in the SDLC, relating them to the process that students experienced in developing a data model. Ask students to apply the steps in the SDLC to each of the businesses listed. Explain that the SDLC is a process that probably does not proceed smoothly from one step to the next. During the process, an idea or project may be stopped, revised, or sent back to prior steps. What happened to the first attempts to fly? The design, build, and production cycles continued for many years before a plane was finally perfected.

Possible Answers

Fast-food company: Developing the Big Mac -- food-kitchen testing, pilot testing, cost analysis, test market, refine, add to menu

Airplane manufacturer: The space shuttle -- design smaller prototype satellites, design unmanned flights, produce shuttle, redesign after accidents

Bridge-building company: Japan's Akashi Kaikyo bridge -- design on paper or computer model, build model, test materials, refine design, build bridge
Rock-star concert promoter: Planning a large event -- market analysis for location, design venue, advertise, build set, bring set to location, hold concert, revise based on attendance, rain, etc.

Clothing designer: Planning a runway show in Paris -- design clothing, contact models, refit to model, design venue, hold event, redesign or produce product from customer response

**Multipage:**
For Internet resources for SDLC, search using keywords "system development life cycle"

**Extension Activity**
The Oracle site
lists industries that Oracle has helped to revolutionize their data needs. Choose an industry to explore specific companies.

**Ask students to choose a company and write a brief report answering the questions:**
What is the company's primary business?
What problems did this business seek to solve?
How did Oracle help this business?
Lesson Preparation

Check to make sure all students can access and log in to HTML DB. The HTML DB icon appears in the upper right corner of this window and looks like this:

The SQL course will use the three following sets of database tables for examples and practice exercises.

Oracle tables: COUNTRIES, REGIONS, DEPARTMENTS, EMPLOYEES, JOBS, JOB_HISTOR Y AND JOB_GRADES

DJs on Demand database tables: D_CDS, D_PACKAGES, D_TYPES, D_THEMES, D_CLIENTS, D_VENUES, D_SONGS, D_TRACK_LISTINGS, D_PARTNERS, D_EVENTS, D_PLAY_LIST_ITEMS, D_JOB_ASSIGNMENTS


Before beginning this lesson, students should access HTML DB to view the tables in each of the three databases. It may be best to choose one database at a time. Using the list of tables, have students query each table using
SELECT * FROM tablename. If possible, students or pairs of students should print out each table.

**Lesson Preparation**

To view the data types of each column, students should query each table using DESCRIBE tablename (or from SQL Workshop view, click the Table icon, and then click the magnifying glass icon next to the table name to show the Table Summary). Using DESCRIBE tablename, students will be able to find the primary key and foreign keys for each table. These columns can be used to connect one table to another.

Using the printed copies of the tables, have students paste them on legal-size paper matching the shared columns (the primary key in one table to the same column name in another table). Use the Oracle database example (see Teacher Preparation Materials) as a guide for the DJs on Demand and Global Fast Foods tables. Assist students with drawing relationship lines between each table.

These graphic layouts of each table will help students visually picture the table structure and will be very useful when learning the SQL commands.

This activity could also be done in groups. Each group works together to prepare a large-wall schematic of the tables for each database.

**What to Watch For**

Check to make sure that students understand and can identify the table keywords. Check students' understanding of how the tables are related.

**Connections**

Interesting databases: The following sites were found on the Internet using the search term "interesting databases." They have potential to show students that their job in a database field could be very fun and interesting. All these sites have "Database" in the main page title. Students could add other sites to this list.

- www.rcdb.com (roller coaster database -- lots of information and searchable)
- www.classical.net (online music database that links to many other databases)
- www.rangercentral.com (Power Rangers database)
- www.museumstuff.com (list of 1,000 museums -- great exploring)
- www.drewsullivan.com (the journalist's database of databases -- super interesting)
What Will I Learn?

In this lesson, you will learn to:

- Define and give an example of a relational database
- Identify table-key terms, including row, column, field, primary key, foreign key
- Relate the importance of databases to everyday life
Why Learn It?

Databases are part of our everyday life even though most of the time we don’t even think about them.

If you’ve ever made an airline reservation, used an ATM machine, or made a cell phone call, you’ve used a database. In fact, many cities use intelligent traffic-guiding-system databases to control stoplights. So the next time you’re waiting at a red light, it may be a database that’s responsible for your delay.

In this lesson, you will learn about databases and how they’re organized and created.
Tell Me / Show Me

To illustrate how important databases have become in today's world, read the following statistics to your class:

- Currently 20% of the world's data resides in relational DBMSs.
- In the next two years, databases are expected to grow larger than 100 terabytes. A database this big would be able to store 100,000 copies of the Encyclopedia Britannica or 200,000 hours of music or about 10 billion web pages.
- The top 10 world's largest databases using the Oracle DBMS are:
  France Telecom, 29.2TB -- a communications company (a TB is a terabyte equivalent to 1,000 gigabytes)
  Amazon.com with, 13 TB -- selling books and merchandise
  The Claria Corporation,12TB -- Internet behavioral marketing company tracking Internet user behavior

For Internet database statistics, use the keywords "largest databases," "how big is a terabyte."
Explain that a relational database can contain one table or many tables. The D_SONGS table shown is just one of several tables in the DJs on Demand database and just one example of the many tables that will be used in this course.

Instruct students to identify the key terms in the D_SONGS table graphic.
Instruct students to use the mouse to identify each of the key terms. Explain each key term.
Tell Me / Show Me

A relational database management system (RDBMS) organizes data into related rows and columns. To access the data in a database, you do not need to know how the data is arranged physically nor do you need to specify the access route to the tables. You simply use structured query language (SQL) statements and operators.

Working with the database is very similar to calling up and talking to a friend on the phone. First, you must choose a method to communicate (the phone). Once connected, you ask your friend a question (a query). In response to your question, your friend answers (return of data). Pretty simple, most of us are experts at this.

In this class, our method of communication with the database will be through the Oracle HTML DB application. When you ask a question using SQL, the application will return an answer.

As shown in the diagram, communicating with an RDBMS is accomplished using a SQL statement entered in the HTML DB application, the request is sent to the Oracle Server on a computer, the request is processed, and the data returned is displayed. In very large databases systems, many users, servers, and tables comprise the RDBMS.
Tell Me / Show Me

SQL statements are grouped into several categories depending on the functions they perform. During this course, you will learn how to use SQL to execute these statements. The data retrieval statement retrieves data from the database using the keyword SELECT.

Categories of SQL Statements

Data manipulation language (DML) statements begin with INSERT, UPDATE, DELETE, or MERGE and are used to modify the table by entering new rows, changing existing rows, or removing existing rows.

Data definition language (DDL) statements set up, change, and remove data structures from the database. The keywords CREATE, ALTER, DROP, RENAME, and TRUNCATE begin DDL statements.

Transaction control (TCL) statements are used to manage the changes made by DML statements. Changes to the data are executed using COMMIT, ROLLBACK, and SAVEPOINT. TCL changes can be grouped together into logical transactions.

Data control language (DCL) keywords GRANT and REVOKE are used to give or remove access rights to the database and the structures within it.

Tell Me / Show Me

Explain each type of SQL transaction using the analogy of a personal online bank account. Many people use online banking to pay bills, check credit-card activity, view checks cashed, and transfer money to and from their checking and savings accounts. Businesses use online banking for loan payments and to manage investments.

Data retrieval -- Check the balance of a checking/savings account.

Data manipulation -- Change an email address that the bank uses to notify a customer that an online bank statement has been posted.

Data definition -- Create a new online account; the bank can alter data in an account or drop an account that is delinquent.

Transaction control language -- Arrange to have a bill paid online and then decide later to change the date originally set for payment. Online bill paying usually has a SUBMIT(COMMIT) option after several transactions have been entered.

Data control language -- The bank can revoke an overdrawn account or a credit card issued for failure to make the payment obligations. The bank can grant other users access to an account if requested by the owner of the account.
Try It / Solve It

Activity: Fast Foods Tables

1. The Global Fast Foods database consists of how many tables? __9__ tables
2. How is the F_SHIFTS table related to the F_STAFFS table?
3. What are the names of the columns in the F_CUSTOMERS table?
4. How many rows of data have been entered in the F_PROMOTIONAL_MENUS table?
5. In the F_FOOD_ITEMS table, column ___regular_code___ is a foreign-key column. What table and column is this key referencing?
6. List the primary key to foreign key relationships required to go from the F_SHIFTS table to the F_REGULAR_MENUS table.
7. Which table(s) contain null values?
Foreign Keys (Tables that reference...) and Foreign Keys (Tables.....references). Step through each table using this feature with students. For this exercise the table references starting with F_SHIFTS to F_REGULAR_MENUS is: f_shifts to f_shift_assignments to f_staffs to f_orders to f_customers then from f_orders to f_order_lines to f_food_items to f_promotional_menus and f_regular_menus.

7. Which table(s) contain null values?
   F_FOOD_ITEMS and F_STAFFS

Students can use HTML DB and "SELECT * FROM tablename;" to view each table in the Fast Foods database. Using the Fast Foods database, students will answer the Fast Foods Tables Activity.

The objective of this activity is to familiarize students with the basic structure of a database table and to introduce the Fast Foods tables they will be using.

Students should be able to relate primary to foreign keys and identify and name examples of column, row, and field.

Reinforce the importance of being able to easily relate tables of information together.
Lesson Preparation

Review the HTML DB activity in “Try It / Solve It” before presenting it to students.

What to Watch For

Verify that each student can log on to http://iacademy.oracle.com and perform the basic tasks required to use HTML DB. If students are required to save their work, make sure they know the correct procedure.

Students will experiment with SQL Workshop. Warn students about deleting or altering any tables. Explain that each student has his/her own schema and is responsible for keeping it intact.

Connection

Students should explore the HELP menu in HTML DB and read the Introductory section;

What is Oracle HTML DB?
About Oracle HTML DB
About Application Builder
About SQL Workshop
About Data Workshop
What Will I Learn?

In this lesson, you will learn to:

- Distinguish between application software and system software and give an example of each
- Demonstrate use of the HTML DB application to enter SQL statements to retrieve data
Why Learn It?

Every day, in one way or another, we come in contact with computer applications. If you checked your email today, it was probably done using an application. If you bought an item at a grocery store, the clerk scanned the item using an application that calculated your bill and updated the store inventory. In this course, you will learn the syntax of SQL using the application Oracle HTML DB.
Although computers have been around since before you were born, their use for business and personal computing didn't take place until application software programs were developed. Application programs allowed the end user, people like you and me, to be able to buy fully developed, ready-to-use programs. It was no longer necessary to know how the program worked, just that it did work and accomplished what we wanted it to do.

Application program software is different from system software. System software consists of low-level programs designed to interact with the computer hardware. Operating systems, compilers, and system utilities are examples of system software. In contrast, application software includes programs for word processing, databases, gaming, and graphics.

Yahoo.com uses the Oracle database to store data. Rather than everyone who wants to search the database or retrieve an entry needing to learn SQL, an application has all the SQL (and other coding languages) preprogrammed into it. With a few mouse clicks, users have access to the information they need.

Tell Me / Show Me

Read the paragraph to students, discussing as you read.

Ask students why Oracle designed a tool like HTML DB?

Possible responses: The average person can't learn all the complicated languages and programs necessary to design their own applications. Every business doesn't have the time or resources to "reinvent the wheel." They want to do what they do and not have to design software.
Tell Me / Show Me

Read the paragraph to students, discussing as you read.

Ask students why Oracle designed a tool like HTML DB?

Possible responses: The average person can't learn all the complicated languages and programs necessary to design their own applications. Every business doesn't have the time or resources to "reinvent the wheel." They want to do what they do and not have to design software.
Activity: Using an Application - HTML DB

SQL Workshop's features are extensive. At this point, the students are anxious to get started. To avoid information overload and to capitalize on their enthusiasm, it is best to keep it simple. As you proceed through the lessons, students will learn to use and access most of SQL Workshop's features. There's not a button, picture, or word they won't have already clicked! For this lesson, demonstrate each of the following features and have students follow along logged in using their own account.

Demonstrate each of the following:

From the HTML DB Home page at http://iacademy.oracle.com, click the SQL monitor icon or the words SQL Workshop:

- The SQL Workshop menu tab should be highlighted.
- Point out the words SQL Command Processor. Explain that this opens the window used to enter SQL commands to access the database.
- Point out Data Browser object information - Click the Table icon only. Show the names of the tables for the Oracle database, the DJ on Demand database, and the Global Fast Foods database. Click one of the magnifying glass icons to show the Table Summary information.
- Exit by clicking the SQL tab in the menu bar.

**Activity: Using an Application - HTML DB**
- Show the drop-down menu for the Schema window and the schema name.
- Explain the SQL statement window to enter SQL commands. Enter the following command here to demonstrate the rest of the SQL tab features listed below. After the command executes, click the SAVE button.
  - SELECT *
  - FROM d_cds;
- The SAVE button requires the student to enter a name for the file.
- The Archive tab is highlighted, and saved SQL commands appear in the window.
- Click the History tab to view the past 200 SQL commands.

**Extension Activity**
- Ask students to research the job titles of analyst, designer, programmer, and user-support manager. These are jobs associated with application design, development, and maintenance. Search the Internet using the keywords "software applications jobs" or [http://www.monster.com](http://www.monster.com) with search keyword "application software designer."
Lesson Preparation

Students will need a copy of their completed high-school courses. Check with counselors for an easy way to accomplish this task.

What to Watch For

It may take several weeks for students to gather the information, or it may be impossible to get all the information. Focus on what can be done.

Set the stage early for the quality of work required. Check for spelling, writing conventions, and a professional appearance in all work.

Some students may not have all the information or a complete academic record. Help them maximize what they have at this point in time.

Make students responsible for keeping/storing their own portfolio information.

Connections

Ask students to locate resources in the school such as the counseling center or career center or daily bulletin/announcements that have information about scholarships, college visitations, and testing dates.
Seek opportunities to have guest speakers from trade schools, colleges, and universities speak to the class.
What Will I Learn?

In this lesson, you will learn to:

- Demonstrate the process and products required for developing a career portfolio and career plan.
- Document academic achievements, certificates, awards, and leadership activities.

What Will I Learn?

Introduce the portfolio activity. Read the "What Will I Learn?" and "Why Learn It?" sections to the students.
A career portfolio is a collection of documents that showcase your accomplishments as a citizen and as a learner. It will contain evidence of your skills, experience, and achievements and will become the cornerstone upon which to build your career plans. It's all about you!
Tell Me / Show Me

Section 16

Lesson 4 - Career Portfolio: Roadmap to Your Future

Tell Me / Show Me

Developing a portfolio is a four-step process. Each step is designed to showcase a different quality that you possess.

Step 1: Your Academic Achievements
Step 2: Your Work and Community Experience
Step 3: Your Personal Interests/ Aptitudes and Career Preferences
Step 4: Your Future Plans

In this lesson, you will complete Step 1: Your Academic Achievements. As we progress through this course, you will develop each of the other steps in the process.

Tell Me / Show Me

Explain that creating a portfolio is a way to organize the many details of one's experiences. It is both a process and a product.

Explain that developing a portfolio will be a four-step process. Briefly explain the four steps and the purpose of each. The four steps are:

Step 1: Your Academic Achievements
Step 2: Your Work and Community Experience
Step 3: Your Personal Interests/ Aptitudes and Career Preferences
Step 4: Your Future Plans

In this lesson, students will complete Step 1: Your Academic Achievements

Read the Career Portfolio: Roadmap to Your Future introductory paragraph to students. Share your own experiences with getting transcripts, writing a resume, completing job applications, creating a placement folder, obtaining letters of recommendation, etc. when applying for college and looking for a teaching job.

Who are the people who would ask to see your portfolio?
**Suggested answers:** Employers, college admission officers, military personnel, scholarship committee members.

Ask for student volunteers to explain their personal experiences in applying for a job, obtaining transcripts, completing scholarship applications, etc.

The school counselor or career counselor should be able to identify the assessment tests given for your area's college entrance and/or a military enlistment. If students have not yet taken college or military assessment tests, this would be an opportunity for the career counselor to speak to the class about the various tests. Encourage students to register to take the tests.
Try It / Solve It

Students will need to collect the information in a central place. Ask them to use a file folder or envelope for organizing the documentation.

If physical documentation cannot be acquired, students can make a list and include the list with the other documentation.

Read each item in the list of academic achievements to the students. Give examples and ask students to give examples for each item in the list.

Remind students of all the types of certificates and awards that could be listed. Students may not remember certificates and awards they have earned.
Lesson 5 - Anatomy of a SQL Statement

Lesson Preparation
None.

What to Watch For
This may be a student's first time using SQL. Insist on a standard for coding statements and demonstrate it early in this lesson. If you want statements of separate lines, show students your standard.

At the beginning, students will be frustrated when their queries don't return what they expected. It is helpful to code several incorrect SQL queries and demonstrate what error messages are returned. This will help students become more independent and help reduce the "it doesn't work" statements.

For instance:
The following statement has a spelling error:
SELT *
FROM employees
The error message is:
ORA-00900: invalid SQL statement
The following statement incorrectly names the table `employee` instead of `employees`:

```
SELECT *
FROM employee
```

The error message is:

```
ORA-00942: table or view does not exist
```

**Connections**

Research the history of the mathematical concept “null.” Where did it come from? How is it different from the concept of “zero”?
What Will I Learn?

In this lesson, you will learn to:

- Match projection, selection, and join with their correct functional capabilities
- Create a basic SELECT statement
- Use the correct syntax to display all rows in a table
- Use the correct syntax to select specific columns in a table, modify the way data is displayed, and perform calculations using arithmetic expressions and operators
- Formulate queries using correct operator precedence to display desired results
- Define a null value
- Demonstrate the effect null values create in arithmetic expressions
- Construct a query using a column alias
Why Learn It?

SECECT is the keyword. It is the only way to retrieve information from the database. When you learn how to use SELECT, you've opened the door to the database. Imagine how convenient it would be to have all the names, addresses, and phone numbers of your friends in a database. When you just wanted last names and phone numbers and no other information, a SELECT statement could easily retrieve this information.
When teaching content, make sure students follow along. Students can quickly be "somewhere else" on the Internet.

This lesson may be a student's first introduction to SQL. Take time for students to practice each new keyword.

Warn students that sometimes doing a SELECT * FROM table can take a long time to return the data. It all depends on the number of rows stored in that particular table. Remember, Oracle tables can store millions of rows of data.

Break this content into show and practice. Explain one SQL keyword/statement at a time, and then have the students practice.

Demonstrate coding conventions to the students. All queries can be in lowercase, but for clarity and ease of reading, you may want to have keywords typed in UPPERCASE. It makes finding student mistakes easier.
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This lesson may be a student's first introduction to SQL. Take time for students to practice each new keyword.

Warn students that sometimes doing a SELECT * FROM table can take a long time to return the data. It all depends on the number of rows stored in that particular table. Remember, Oracle tables can store millions of rows of data.

Break this content into show and practice. Explain one SQL keyword/statement at a time, and then have the students practice.

Demonstrate coding conventions to the students. All queries can be in lowercase, but for clarity and ease of reading, you may want to have keywords typed in UPPERCASE. It makes finding student mistakes easier.
Tell Me / Show Me

Tell Me / Show Me

The SELECT statement retrieves information from the database. In its simplest form, a SELECT statement must include the following:

- A SELECT clause, which specifies the columns to be displayed.
- A FROM clause, which specifies the table containing the columns listed in the SELECT clause.

Throughout this course, the following will be used:

- A keyword refers to an individual SQL statement. For example, SELECT and FROM are keywords.
- A clause is a part of a SQL statement. For example, SELECT title is a clause.
- A statement is a combination of the two clauses. For example, SELECT title FROM songs is a statement.
Tell Me / Show Me

A SELECT statement can do the following:

**Projection:** Used to choose columns in a table

**Selection:** Used to choose rows in a table

**Join:** Used to bring together data that is stored in different tables by creating a link between them (you will learn about this later)

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**Capabilities of SQL SELECT Statements**

**Table 1**

**Table 2**

**Join**

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Tell Me / Show Me
Tell Me / Show Me

Ask students to write a query that would subtract 300 from each person’s salary and a query that would give each person a 5% raise.

```
SELECT last_name, salary, salary - 300
FROM employees;

SELECT last_name, salary, salary * 1.05
FROM employees;
```
If operators within an expression are of the same priority, then evaluation is done from left to right. Explain using the following example: Operators that appear in the same group have the same precedence. Which means in the multiplicative group that multiplication is done before division. In the additive group, addition is done before subtraction.

You can always use parentheses to force the expression within parentheses to be evaluated first. In the example 5(5*6) + 20, the expression (5*6) is processed first, that value (30) is multiplied by 5 to equal 150, and then 20 is added to the result.

Rewrite the SQL statement shown to produce the results shown in the Operator Precedence table.

```
SELECT last_name, salary, 12*salary+100  rewrite as 12*(SALARY + 100)
FROM employees;
```
If operators within an expression are of the same priority, then evaluation is done from left to right. You can always use parentheses to force the expression within parentheses to be evaluated first.

In the example tables shown, can you explain the differences in the output between the query that used parentheses and the one that didn’t? Rewrite the SQL statement shown to produce the results shown in the Operator Precedence table.

**Rewrite the SQL statement shown to produce the results shown in the Operator Precedence table.**

```sql
SELECT last_name, salary, 12*salary+100  rewrite as 12*(SALARY + 100)
FROM   employees;
```
In the table shown, what would be the result of the following query for Mr. King and Mr. Taylor?

```
SELECT last_name, 12*salary*commission_pct
FROM employees;
```

Taylor will return a value; King will return null.

Ask students to create a simple query that uses a divide by zero expression. Such as:

```
SELECT salary/0
FROM employees;
```

Explain the error returned:

report error: ORA-01476: divisor is equal to zero
In SQL, aliases are one of two places that use double quotes. Have students practice creating aliases with and without using AS.

Explain the purpose of an alias. Your boss would probably not recognize what a column name such as DEPT_NO means. It would be your job to create a report with the column name "Department Number" instead.

Explain that double quotation marks are required for aliases longer than one word or when the format of the alias is anything other than the default uppercase name (e.g., Department Name, or department, or dept.)

Explain that the pipe (|) means OR in this example. The pipe key is the caps lock position above the backslash (\) on most keyboards.
Try It / Solve It

Answers:

1. A SELECT statement with any column name would be an example.
2. SELECT last_name AS "Client", email AS "Email Address"
   FROM d_clients;
3. SELECT last_name, salary *1.05 +.50  or  (salary *1.05) +.50
   FROM f_staffs
Try It / Solve It

Answers:

4. c. SELECT *

5. b. Payment = car_cost * 1.25 + 5.00 - (tax - license) substitute 10.00 for car_cost to demo answer.

6. Keywords: SELECT FROM WHERE
Clause: SELECT employees.employee_id, employees.last_name, or one of the other two lines
Statement: all three lines combined
Try It / Solve It

Try It / Solve It

Lesson 5 - Anatomy of a SQL Statement

Try It / Solve It

7. Label each example as SELECT, PROJECTION or JOIN.
   a. Please give me Mary Adam's email address.
   b. I will need each customer's name and the order_total for their order.
   c. I would like only the manager_id column, not any of the other columns.

8. Which of the following statements are true?
   a. null * 25 = 0
   b. null * 6.00 = 6.00
   c. null * .05 = null
   d. (null + 1.00) * 5.00 = 5.00

9. How will the column headings be labeled in the following example?
   SELECT bear_id bears, color AS Color, age "age"
   FROM animals;
   a. bears, color, age
   b. BEARS, COLOR, AGE
   c. BEARS, COLOR, age
   d. Bears, Color, Age

Try It / Solve It

Answers:

7. __ s __ a. Please, give me Mary Adam's email address.
   __ j __ b. I will need each customer's name and the order_total for their order.
   __ p __ c. I would like only the manager_id column, not any of the other columns.

8. c. null * .05 = null

9. c. BEARS, COLOR, age
Try It / Solve It

Section 16
Lesson 5 - Anatomy of a SQL Statement

Try It / Solve It

10. Which of the following words must be in a SELECT statement in order to return all rows?
   a. SELECT only
   b. SELECT and FROM
   c. FROM only
   d. SELECT * only

Extension:
- Build the SELECT statement to show all columns from the Employees table.
- Create the SELECT statement to show department name and location from the Departments table.
- Show & Discuss Demo: Using Arithmetic Expressions and Operators (from current curriculum, iLearning)
- Show & Discuss Demo: Rules of Precedence (from current curriculum, iLearning)

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Try It / Solve It

Answers:
10. b. SELECT and FROM

Review practice exercise answers with students.
Complete the study guide and review with students.