Unit 1: Adv. Computer Applications - Access/Data Base

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Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Computer App. 2, Unit 1

Adv. Computer Applications - Access/Data Base

Belleville Board of Education

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Unit Overview

Microsoft Access is a database tool where you can create records to store information. For example, in sales, you can create a record for a particular customer which stores the customer's name, address, phone, etc. Sort of like a customer master. In Marketing, you can create a record for a product with information such as product name, description, price, etc. After the records are set up, you can use queries to produce reports against the customers or products. For example, you want a list of customers living in California so you can target them for a special promotion, etc.

For more information, go to Microsoft's homepage on how to use Access:

http://office.microsoft.com/en-us/access/FX100646921033.aspx

Enduring Understanding

Enduring Understandings for this Unit are:

A database can be used to organize and manage large amounts of information in a variety of personal and professional situations.

• MS Suite is a universal tool used in personal, professional and educational settings.
• Microsoft applications are interchangeable.
• MS Excel is a tool used to communicate data in an organized format in a variety of personal and professional situations.
• Data can be calculated, sorted and analyzed using MS Excel.
• A database can be used to organize and manage large amounts of information in a variety of personal and professional situations.
• MS Applications are effective vehicles for communicating information for both personal and professional uses.
• MS Applications can enhance communications.
• Principles of Design must be considered in the creation of documents, spreadsheets, presentations and databases.
• To communicate effectively, a variety of vehicles can be used suitable to task, purpose, and audience.

Essential Questions

How can a database be used to organize information?
• What information should be gathered to include in a database?
• In what situations, personal or professional, can MS Excel be used?
• How can MS Excel be used to solve problems?
• How can MS Excel be used to improve communication?

Exit Skills

Skills that students should have obtained by the end of this unit are:

Define database concepts. Performance will be satisfactory when:
o learner describes a database.
o learner defines terminology for field, record, table

Create Access Database. Performance will be satisfactory when:
o learner identifies elements of the Microsoft Access window.
o learner identifies table elements such as field types, field properties, and primary keys.
o learner creates and modifies tables.
o learner uses tools to locate records in a database.
o learner prints records.
o learner prints tables.
o learner creates and prints simple forms.
o learner creates and prints simple reports.

Query an Access database. Performance will be satisfactory when:
o learner states the purpose of a query to themselves
o learner creates queries.
o learner creates queries using compound criteria involving AND and Or.
o learner creates calculations in queries.
o learner understands the logical and comparison operators in a query
o learner prints a query

Establish table relationships in Access. Performance will be satisfactory when:
o learner defines a one-to-many relationship between one or others

New Jersey Student Learning Standards (NJSLS)

TECH.8.2.12.C.7	Use a design process to devise a technological product or system that addresses a global problem, provide research, identify trade-offs and constraints, and document the process through drawings that include data and materials.
TECH.8.2.12.D	Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.
TECH.8.2.12.D.6	Synthesize data, analyze trends and draw conclusions regarding the effect of a technology on the individual, society, or the environment and publish conclusions.
TECH.8.2.12.D.CS1	Apply the design process.
TECH.8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity of computers in our world.
TECH.8.2.12.E.2	Analyze the relationships between internal and external computer components.
TECH.8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).
TECH.8.2.12.E.CS1	Computational thinking and computer programming as tools used in design and engineering.

Interdisciplinary Connections

9.3.12.BM.1	Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision-making in business.
9.3.12.BM.3	Explore, develop and apply strategies for ensuring a successful business career.
9.3.12.BM.5	Implement systems, strategies and techniques used to manage information in a business.
9.3.12.BM.6	Implement, monitor and evaluate business processes to ensure efficiency and quality results.
9.3.12.BM-ADM.2	Access, evaluate and disseminate information for business decision making.
LA.RST.9-10.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
9.3.21.BM-MGT.1	Describe and follow laws and regulations affecting business operations and transactions.
9.3.12.BM-MGT.2	Access, evaluate and disseminate information for business decision making.
LA.RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
9.3.12.BM-MGT.3	Apply economic concepts fundamental to global business operations.
9.3.12.BM-MGT.5	Plan, monitor, manage and maintain the use of financial resources to ensure a business's financial wellbeing.
9.3.12.BM-MGT.8	Create strategic plans used to manage business growth, profit and goals.
LA.WHST.9-10.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant sufficient textual and non-textual evidence.
9.3.12.BM-HR.7	Plan, organize and implement compensation, benefits, health and safety programs.
LA.WHST.9-10.2	Write informative/explanatory texts, including the narration of historical events, scientific

procedures/experiments, or technical processes.

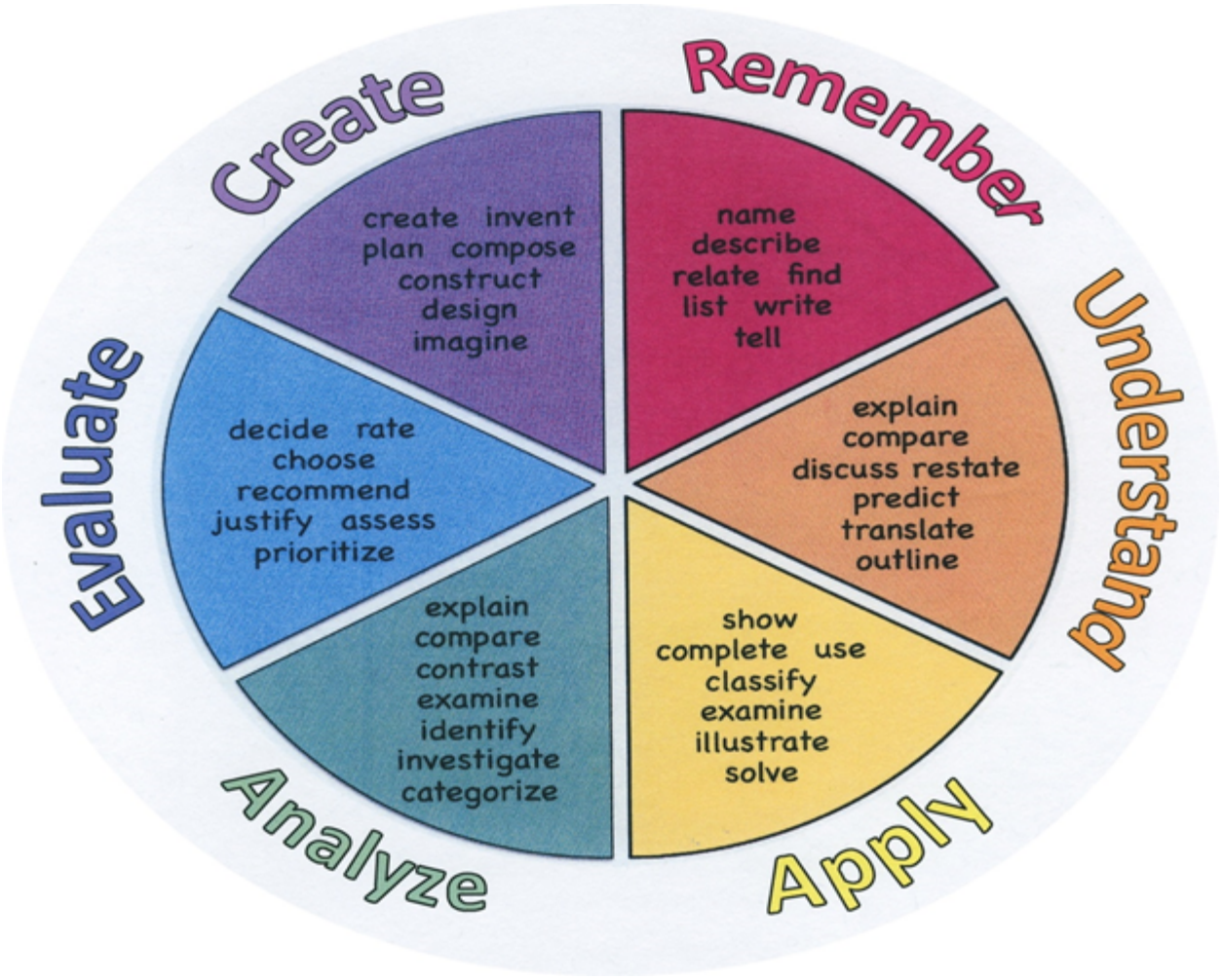
Learning Objectives

The students will be able to:

Describe databases and database management systems.
Identify uses of a database system.
Describe the features of the MS Access window.
Research information to be included in an MS Access database.
Organize how information will be stored in an MS Access database.
Create a database.
Input information into database tables.
Organize data using MS Access tools

Action Verbs: Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy.

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Choose	Categorize	Appraise	Combine
Describe	Defend	Dramatize	Classify	Judge	Compose
Define	Demonstrate	Explain	Compare	Criticize	Construct
Label	Distinguish	Generalize	Differentiate	Defend	Design
List	Explain	Judge	Distinguish	Compare	Develop
Locate	Express	Organize	Identify	Assess	Formulate
Match	Extend	Paint	Infer	Conclude	Hypothesize
Memorize	Give Examples	Prepare	Point out	Contrast	Invent
Name	Illustrate	Produce	Select	Critique	Make
Omit	Indicate	Select	Subdivide	Determine	Originate
Recite	Interrelate	Show	Survey	Grade	Organize
Select	Interpret	Sketch	Arrange	Justify	Plan
State	Infer	Solve	Breakdown	Measure	Produce
Count	Match	Use	Combine	Rank	Role Play
Draw	Paraphrase	Add	Detect	Rate	Drive
Outline	Represent	Calculate	Diagram	Support	Devise
Point	Restate	Change	Discriminate	Test	Generate
Quote	Rewrite	Classify	Illustrate		Integrate
Recall	Select	Complete	Outline		Prescribe
Recognize	Show	Compute	Point out		Propose
Repeat	Summarize	Discover	Separate		Reconstruct
Reproduce	Tell	Divide			Revise
	Translate	Examine			Rewrite
	Associate	Graph			Transform
	Compute	Interpolate			
	Convert	Manipulate			
	Discuss	Modify			
	Estimate	Operate			
	Extrapolate	Subtract			
	Generalize				
	Predict				



Suggested Activities & Best Practices

Upon completion of this section, please remove all remaining descriptions, notes, outlines, examples and/or illustrations that are not needed or used.

Guidelines for Suggested Activities:

- Includes activities **appropriate & specific** to the development of the Unit;
- Is comprised of the variety of learning activities that will be referenced in lesson plans, constructed/developed and instructionally delivered in the classroom;
- Are authentic;
- Recognizes the learning styles of the students;
- Integrates problem- or project-based learning.

Assessment Evidence - Checking for Understanding (CFU)

Unit test-summative assessment

Think, pair, share-formative assessment

Web-based assessment-alternate assessment

Create a Multimedia poster-benchmark assessment

- Admit Tickets
- Anticipation Guide
- Common Benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- DBQ's
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Learning Center Activities
- Multimedia Reports
- Newspaper Headline
- Outline

- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit review/Test prep
- Unit tests
- Web-Based Assessments
- Written Reports

Primary Resources & Materials

Microsoft Office Suite / Windows desktop computer for each student
Textbook: TBD

Smart Board

Video instruction

Ancillary Resources

GCFLEARNFREE.ORG, You Tube Videos, Online Instruction-Tutorials

Technology Infusion

Khan Academy, GCFlearnfree.org., online videos and tutorials

What **Technology Infusion** and/or strategies are integrated into this unit to enhance learning? Please list all hardware, software and strategies. Please find a technology pedagogy wheel for assistance while completing this section.



Alignment to 21st Century Skills & Technology

Upon completion of this section, please remove all remaining descriptions, notes, outlines, examples and/or illustrations that are not needed or used.

Mastery and infusion of **21st Century Skills & Technology** and their Alignment to the core content areas is essential to student learning. The core content areas include:

- English Language Arts;
- Mathematics;
- Science and Scientific Inquiry (Next Generation);
- Social Studies, including American History, World History, Geography, Government and Civics, and Economics;
- World languages;
- Technology;
- Visual and Performing Arts.

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
CAEP.9.2.12.C.5	Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.

21st Century Skills/Interdisciplinary Themes

Upon completion of this section, please remove all remaining descriptions, notes, outlines, examples and/or illustrations that are not needed or used.

Please list only the **21st Century/Interdisciplinary Themes** that will be incorporated into this unit.

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

21st Century Skills

Upon completion of this section, please remove all remaining descriptions, notes, outlines, examples and/or illustrations that are not needed or used.

Please list only the **21st Century Skills** that will be incorporated into this unit.

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

Differentiation

Upon completion of this section, please remove all remaining descriptions, notes, outlines, examples and/or illustrations that are not needed or used.

Please remember: Effective educational **Differentiation** in a lesson lies within content, process, and/or product.

Please identify the ones that will be employed in this unit.

Differentiations:

- Small group instruction
- Small group assignments

- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe
- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest

- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Special Education Learning (IEP's & 504's)

Please identify the **Special Education Learning** adaptations that will be employed in the unit, using the ones identified below.

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- Provide modifications as dictated in the student's IEP/504 plan
- reduced/shortened reading assignments
- Reduced/shortened written assignments

- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

English Language Learning (ELL)

Please identify the **English Language Learning** adaptations that will be employed in the unit, using the ones identified below.

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

At Risk

Please identify Intervention Strategies that will be employed in the unit, using the ones identified below.

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.

- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Talented and Gifted Learning (T&G)

Please identify the **Talented and Gifted** adaptations that will be employed in the unit, using the ones identified below.

- Above grade level placement option for qualified students
- Advanced problem-solving
- Allow students to work at a faster pace
- Cluster grouping
- Complete activities aligned with above grade level text using Benchmark results
- Create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- Debate issues with research to support arguments
- Flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- Multi-disciplinary unit and/or project
- Teacher-selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities
- Utilize exploratory connections to higher-grade concepts
- Utilize project-based learning for greater depth of knowledge

Sample Lesson

See Unit 3 for Sample Lesson

as well as here:

A student with intermediate skills learns the basic tools of using Microsoft Access. In this class students will focus on

creating tables and importing data from other locations.

Lesson Objectives

At the end of the class, the student will:

- Understand what Access is and what it does.
- Know how to create a table in Access.
- Know how to import data into Access.
- Know how to create relationships between tables.

Lesson Prep Work

(30 min, at a minimum, prior to student arrival)

- get in early to test for technology failure, because it will happen :-)
- pre-save music_store1.accdb and inventory.xlsx to the desktop of each student computer
- print handouts

Lesson Prerequisites

- Thorough understanding of Microsoft Excel and years of experience.

Lesson Outline

The lesson is completed in one (120) minute class session.

(5) Introduction

- Introduce instructor, students.
- Let students know it's okay to take phone calls, but ask them to put their phone on vibrate and answer calls outside the classroom.
- Inform students that they can sit back and watch if the class is too advanced.
- Inform students they can go to the bathroom, they don't need permission.
- Show order in which class will happen. Explain scope of class.
- *We are going to cover how to create a database from scratch. This is what database administrators do. Most people only need to know how to enter data into Access. We are not going to cover data entry, we are going to cover how to create a database from scratch. This class will not set you up to be a database administrator, but it will give you a good overview and help you identify where there are problems in databases you use.*

(10) What is a Database?

- What is a Database?
    - Access is a relational database, meaning that the data you are collecting is related across a

series of tables. The tables are connected using a piece of shared data.
    - Relational databases are great for any set of data that will contain a bunch of redundant information.
    - If you have a business and you want to track orders, every order will have the customer's name and contact information.
    - In Excel, every time you enter an order, you need to retype all of that information, which leads to more work and more of a chance for errors.
    - In Access, you enter the customer info once and tell any new orders to reference that information. This also makes updating information much simpler.
    - Access versus Excel – how do you choose?
        - *Activity: Look at an Excel worksheet with a ton of repeating data.*
            - Step 1 – Open the Excel workbook that will be the data for our music store inventory.
                - Point out all of the repeating data (e.g. artists, labels, years…)
                - The benefit of using Access is that it can handle large amounts of repeating data better than excel.
            - *Discussion: What should you look for in your data to see if you should use Access?*
                - Do you have a lot of repeated data?
                - Do you want to track actions or events?
                - Do you have a lot of data?
                - Is your data mostly text?
                - Do you need to help users enter data?
                - Do your users need reports?
                - Do you need multiple people to access the database at once?
                - If your answer is yes to any of these, you need a relational database.

(5) The Access Workspace

- *Activity: Open the music_store1 from the desktop*
    - Step 1 – Double click on the icon on the desktop.
    - Step 2 – Click on the security button in the banner at the top of the workspace.
        - Access is neurotic about security. Any time you open a workbook, you will have to go through this enabling process to have access to all of the information in the workbook.
        - Step 3 – Click on enable content and click OK.
        - *Explanation*
            - Ribbon – our menu options here. If you see different options than the instructor, that is because you are looking at a different tab.
            - Navigation Pane – where all the objects you create in Access can be found.

(20) Objects in Access

- Tables
    - *Explanation*
        - Tables are a group of records stored in rows and columns.
        - *Activity: Open the Inventory table and examine it.*
            - Step 1 – Double click on the Inventory table.
                - Field is any column of data, e.g. Artist or Album or Year…

- Record is any single item on the table, e.g. 233, 31Knots…
- Point out record navigation at the bottom & new record button.
- Step 2 – Right click on the tab for the Inventory table.
    - Point out the option to close the tab.
    - Step 3 – Select Design View.
        - This is the view that allows you control over what the table looks like.
        - We will spend a significant portion of today in this view.
    - Step 4 – Right click on the Inventory table tab.
    - Step 5 – Click on Datasheet view.
    - Queries
        - *Explanation*
            - A query lets you pull specific information from one or more tables based on search conditions you set.
            - For example, right now, we have our data split into 3 different tables, Customers, Inventory, & Orders. To get a full order record, I need to pull information from my customer table, my inventory table and my order table. I can do this using queries.
- *Activity: Open OrderQuery and examine it.*
    - Step 1 – Double click on OrderQuery.
        - Point out what data shows up in the query.
        - Step 2 – Right click on the OrderQuery tab.
        - Step 3 – Click on Design View.
            - Point out the relationship lines between data on different tables.
            - Point out what data is being pulled from which table at the bottom.
        - Step 4 – Right click on the OrderQuery tab.
        - Step 5 – Click on Datasheet View.
        - Forms
            - *Explanation*
                - Forms are used to make data entry and management easier for the end user.
                - Think about filling in a job application. There is a form that you fill in so that you don't have to remember all of the data a potential employer might need. Because the form has a field for previous jobs, you get to fill in information about your work history.
- *Activity: Open OrderForm*
    - Step 1 – Double click on OrderForm.
        - Run through adding an order.
        - Point out that Access saves information by default. We don't need to actually click the save button. That is just there for our end user.
        - Step 2 – Right click on the OrderForm tab.
        - Step 3 – Click on Design View.
            - Point out the design elements of the form.
        - Step 4 – Right click on the OrderForm tab.

        - Step 5 – Click on Form View.
        - Reports
            - *Explanation*
                - Reports are used to present selected data in your database.
                - They are particularly useful for printing, so layout is rather important.
                - If you've ever ordered anything off of Amazon.com, you've probably seen the ticket that comes with your order information on it. Think of that, but with a bunch of customer's information, so the entire list of what people ordered from a warehouse in a single day.
    - *Activity: Open OrderReport*
        - Step 1 – Double Click on OrderReport.
            - Point out the data that is displayed in the report.
            - Step 2 – Right click on the OrderReport tab.
            - Step 3 – Click on Design View.
                - Point out the elements of the design view and how they relate to the report view we just looked at.
            - Step 4 – Right click on the OrderReport tab.
            - Step 5 – Click on Report View.
                - *Teacher's tip: at this point, students should see that they can access any view of any object by right clicking on the tab. Ask students how they navigate to any other view of any object in their database.*
                - Navigate Between Open Tabs and Close Tabs
                    - *Explanation*
                        - Now we have a bunch of tabs open.
                        - We need to know how navigate between our open objects and close objects we are done with.
    - *Activity: Navigate between tabbed objects.*
        - Step 1 – Point out the tabs at the top of the object viewing field.
        - Step 2 – Click on any of the tabs to view that object.
    - *Activity : Close open objects.*
        - Step 1 – Right click on any one of your tabbed objects.
        - Step 2 – Click on Close.
            - This closes just the one object we had open.
            - Step 3 – Right click on any of the still open objects.
            - Step 4 – Click on Close All.
                - Now all of our objects are closed.

(15) Planning for a New Database

- *Explanation*
    - We are going to make our database from scratch.
    - Before we make our database, we should have a good idea of what data we need to represent and how it is going to be grouped together.
    - In this case, we are going to try to come up with this content without really having the

experience to draw from.
    - In real life, we would be interviewing people who have been keeping records for us about what data they need and how they use it. We would try to design the database to meet their needs and streamline their processes.
    - For this database, we are going to track inventory and orders for a music store.
    - *Activity: Determine what data needs to be collected to run a music store.*
        - Step 1 – Ask students what data they think needs to be collected to run a music store. Write all of their suggestions down on the whiteboard. If they get stuck, try encouraging them using some of these:

Artist Name

Album Name

Album Label

Album Year

Record Company

Customer Name

Customer Address

Customer Email

Customer Phone

Order Date

Item Ordered

Customer who ordered

- Step 2 – Ask students which information looks like its grouped together.
    - You should end up with categories for Inventory, Customer & Orders.
    - *Explanation*
        - When you are creating a database, you want to split your data up into the smallest bits of meaningful data possible. This process is called data normalization.
        - Essentially, you don't know how this database is going to be used in the future, so you want each field to be the smallest meaningful factor.
        - *Activity: Simplify the data you are going to collect.*
            - Step 1 – Ask students if they can identify any fields that might be groups of data that could be split up.
                - Customer name
                - Customer address
            - Step 2 – Split up the data into its smallest meaningful data
                - Customer First Name
                - Customer Last Name

        - Street Address (which could be split further, and likely would be in a real database)
        - City
        - State
        - Zip

(20) Creating a New Database in Access

- *Explanation*
    - Now we've done the hardest part, the thinking.
    - We are now going to start our database and start to put together our tables to collect our data.
    - *Activity: Open a new Access database and start a new table.*
        - Step 1 – Click on the start menu and type in Access.
        - Step 2 – Click on the shortcut to Access 2013.
        - Step 3 – Select a blank Access Database.
            - By default, a new database opens to an empty table.
            - Step 4 – Right click on the table tab and select Design View.
            - Step 5 – Title the table Customers and click OK.
            - Step 6 – Change ID to CustomerID.
                - Explain that Access needs a unique identifier for each record in a table. This is most easily accommodated with an AutoNumber. Access starts at 1 and makes a new number for each record in the table.
                - Explain that all fields should be titled with no spaces. So your field headings will be CustomerID and FirstName, NOT Customer ID and First Name. If you leave spaces in the name, Access (or more specifically, SQL, the language Access uses to manipulate your information) can have issues looking at your information in the future.
            - Step 6 – Include all the rest of the information you talked about in database design.
                - FirstName – text
                - LastName – text
                - Street Address – text
                - City – text
                - State – text
                - Zip – text
                    - The only time you should format your field as a number is when you are going to add values together, like a price field. Since we won't be adding zip codes together, it will be easier to deal with as text.
                    - *Explain Input Masks*
                        - Input masks force a standard language for people entering data into your database.
                        - Do you want some people typing in "Colorado" and others "CO"? Not really.
                        - *Activity: Use Input Masks*
                            - Make the State field have a Field Size limit of 2.
                            - Use the Input Mask Wizard for Zip Code.
                                - 0s mean that a value is required.
                                - 9s mean that the value is optional.
                                - Ask students how they would make the Zip

Code field a required 9 digit field.

- *Explain Data Types*
    - Autonumber – automatically inserts consecutive numbers.
    - Text – can contain numbers, text or any combination, but is limited to 255 characters.
    - Memo – advanced text field – can store up to 2GB per field and supports formatting.
    - Number – can hold values up to 16 bytes (a whole lot)
    - Date/Time
    - Currency
    - Yes/No – contains true or false data.
    - Hyperlink – stores web addresses.
    - Attachment – can store images, documents, charts, any file.
    - OLE – a way for Office software to share information between programs.
    - *Explain Primary Key*
        - The primary key is a field that is guaranteed to contain a unique value and is used to identify a record. This field cannot be left blank and it cannot contain duplicates.
            - Think of Social Security Numbers – it is a unique number that no one else has. Since it's unique, it guarantees that only you receive the benefits from what you've paid into Social Security. We want each record in our tables to have the same protection –we're looking for a specific album or customer, they each have a unique number that refers to *only* them, so we can avoid ordering the wrong album for a

customer or sending an order to the wrong person.

- In this case, we are going to use our CustomerID field as an autonumber to create that unique ID.
- Point out that next to the Customer ID field name, there is a key telling Access that that is the primary key.
- This key will become essential when we talk about creating relationships between tables in our database. Remember, Access is a relational database!
- Go back to Datasheet view by right clicking on the tab.

(10) Add Data to a Table

- *Activity: Add data to CustomerID table.*
  - Step 1 – Right click on the CustomerID tab and go back to Datasheet View.
  - Step 2 – Click in the first empty row.
  - Step 3 – Skip the first column (the autonumber), Access will take care of this value for us.
  - Step 4 – When you type information into the FirstName field, you should see the autonumber populate.
  - Step 5 – Ask students to make up customer information for several customers.
  - Step 6 – Adjust cell width to accommodate the full StreetAddress section.
  - *Activity: Create a new table.*
    - Step 1 – Click on the Create tab and select Table.
    - Step 2 – Right click on the new table tab and select Design View.
    - Step 3 – Name the table Orders and click OK.
    - Step 4 – Change the ID field to OrderID.
    - Step 5 – Insert in the rest of the information you need for your Order table.
      - ItemOrdered - Text
      - Date – Text
        - Look at Input Mask for Date.
        - Customer – Text
      - Step 6 – Verify that the OrderID is the primary key for this table.

(15) Import Data from Excel

- *Explain Import Data*
  - We already have all of our inventory stored in our Excel spreadsheet we saw earlier.
  - We don't want to have to retype all of that data, so we are going to have Access import it and add it to a table it creates for us.
  - *Activity: Import data from Excel.*
    - Step 1 – Click on Excel in the Import group on the External Data.
      - *Teacher's Tip: Make sure students know the difference between import and export or at least find the right button in the right group.*
      - Step 2 – Use the Browse button to find the Excel spreadsheet on the desktop.
      - Step 3 – Keep the radio button to put the data in a new table selected.
      - Step 4 – Click on OK.
      - Step 5 – Click on Next several times.
      - Step 6 – Change the title of the table to Inventory and click Finish.

- Step 7 – Right click on the tab for Inventory and select Design View.
- Step 8 – Change ID to ItemID.

(10) Create Relationships between Tables

- *Explanation*
  - We've created the tables that are going to make up our database, but the key to using Access is the relationships between tables.
  - We need to tell Access how our data relates across tables.
  - Essentially, in this scenario, our Orders are comprised of data from the Customers table and the Inventory table.
  - We are going to use the autonumber primary key we designated in both the Customers and Inventory tables to relate back to the data we are collecting in our Orders table.
  - Then when we want to pull more data in the future, we can see the relationship between all of the data we have collected.
  - *Activity: Create relationships between tables.*
    - Step 1 – Right click on one of the tabs and select Close All and save all changes.
    - Step 2 – Click on Relationships in the Show/Hide group on the Database Tools tab.
    - Step 3 – Double click on each table name to add them to the relationships board.
    - Step 4 – Click on Close.
    - Step 5 – Click and drag on the table headings to rearrange them in the board.
    - Step 6 – Point out the primary keys in the table field lists.
    - Step 7 – Click and drag to create a relationship between CustomerID in the customer table and Customer in the Orders table.
      - We are taking the primary key from one table and relating it to a foreign key on another table.
      - Foreign keys are fields in a table that relate back to the primary key field in another table.
      - Step 8 – Select the checkbox next to Enforce Referential Integrity.
        - This means that if you update data on one table, the changes will be reflected on the other.
        - Point out that the data type is One to Many. This means that the primary key is unique, but the foreign key allows duplicate values; for each record of the primary key on the Customer table, there can be multiple records on the Orders table. This means that one customer can order many items.
        - The other type of relationship is a One to One, which means that both the foreign and primary keys are unique.
        - You will almost always use a One to Many relationship.
      - Step 9 – Click on Create.
      - Step 10 – Create a One to Many relationship with referential integrity between ItemID on the Inventory table and ItemOrdered on the Orders table.
        - We have now developed relationships between our tables. The significance of these relationships will become apparent when we look in the next two classes at Queries, Forms and Reports.

(5) Homework

- *Explain:*
    - Students are expected to practice for at least 2 hours between each of the classes in this series.
    - Every library has both internet and Access on their computers. Please practice at a location that is convenient for you!
    - *Access tutorials at gcflearnfree.org.*
        - Step 1 – Go to gcflearnfree.org.
        - Step 2 – Click on the Microsoft Office tile.
        - Step 3 – Click on Access 2013.
        - Step 4 – Assign the tutorials on Getting Started with Access, Managing Databases and Objects, Working with Tables, Modifying Tables, and Designing Your Own Database.

(5) Conclusion

- Go over handout, review material, and emphasize contact info & further resources on handout.
- Any questions? Final comments?
- Remind to take survey.