Assignment 2: What is a Database?

What is a Database?

Databases are used everywhere in the world today. For example, a store may use a database to organize product information. Or, an office may use a database to organize customer information.

A database is a collection of information that is stored on a computer using a program such as Microsoft Access. A database lets you organize and find lots of information quickly and easily.

A database is like a big filing cabinet. It holds, or stores, information on your computer.

In a filing cabinet are folders. A database does not use folders, instead it has tables. A table is a grid, made up of columns and rows that are used to store data.

Each folder in a filing cabinet holds paper. A database does not use paper. Instead, a database has forms. A form is like a piece of paper that you see on your computer screen. You can use it to read information in the database or add new information into a table.
In a filing cabinet are pieces of paper with information on each one. In a database, we call the piece of paper with information a record. A **record** is a group of data about one person, event, or thing.

On each piece of paper are words or pictures. In a database, we call each word and picture a **field**. A **field** is one piece of data in a record. A record has many fields.

### Answer Questions about a Database

1. **What is a database?**
   - *A database is a collection of information that is stored on a computer.*

2. **Why would a person want to use a database to store information?**
   - *A database lets a person organize and find lots of information quickly and easily.*

3. **What is a table?**
   - *A table is a grid made up of rows and columns used to store information.*

4. **What is a form?**
   - *A form is a sheet that has controls used to view and enter information into a table.*

5. **What is a record?**
   - *A record is a group of data about one person, event, or thing.*

6. **What is a field?**
   - *A field is one piece of data in a record.*

7. **You are going to look at a database of space missions. What type of data do you think will be in the database?**
   - For the paperless classroom, students can answer the questions in their digital workbooks using the latest version of Adobe Reader. The Teacher Guide includes answers.
**Assignment 3: About Microsoft Access**

You will use Microsoft Access to create your database. Answer the questions to learn more about the program.

**Open the Space Exploration Database in Microsoft Access**

- Open the Mission folder. (Ask your teacher how to do this.)

Using the Space Exploration database, students are introduced to Microsoft Access.

**Label the Parts of the Access Window**

Use the descriptions on the next page to label the parts of the window below.

1. **File Tab**
2. **Quick Access Toolbar**
3. **Ribbon**
4. **Window Controls**
5. **Navigation Pane**
6. **Navigation Buttons**
7. **Filter Indicator**
8. **Search Box**
9. **Document Pane**
10. **Document Tab**
11. **Status Bar**

Some pages have been removed from this sample.
12. The ribbon has **tabs**. Each tab holds commands that do a similar job. Draw a box around the Home tab.

13. Each tab is divided into **groups**. A group is a collection of commands that do similar actions like add, save, or delete a record. Draw a box around the Records group.

14. Each group has **commands**. Commands are a button, box, or menu that tells the computer what to do. Draw a box around the View command in the Views group.

**Questions About the Ribbon**

15. Look at the Home tab. In which group of commands can you change the look of the words, such as font, font size, or underline?  
   **Text Formatting group**

14. Look at the Home tab. What group has the command *New*?  
   **Records group**

15. If you want to create a table, form, or report which tab of the ribbon should you choose?  
   **Create tab**

16. Click the Create tab. What group?  
   **Forms group**

**Exit Microsoft Access**

▷ Click Close.
Assignment 4: Look at a Table and a Form in a Database

To prepare for your cyberspace mission you need to learn more about the parts of a database. You are going to look at a table and a form in the Space Exploration database.

The Space Exploration database has information about space missions. You can view the records to learn about important events in space exploration such as when man landed on the moon, deployed the Hubble Space Telescope, or lived on the International Space Station. You will also be able to learn about some of the astronauts that took part in these historic missions.

Open the Space Exploration Database

▷ Open the Mission folder.
▷ Open the Space Exploration database.

Open the Mission Table

▷ From the Navigation Pane, double click mission under the Tables category.

Students study a database to gain an understanding of tables and forms. They will use this knowledge later when they construct their own database.

A table is a grid, made up of columns and rows. A table is used to store information. A database can have one or more tables.

<table>
<thead>
<tr>
<th>Session</th>
<th>First Name</th>
<th>Last Name</th>
<th>Picture</th>
<th>Title</th>
<th>Mission Num</th>
<th>Launch Date</th>
<th>Purpose</th>
<th>Click to Add</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Philippe</td>
<td>Forman</td>
<td>Picture Mission Specia STS-111</td>
<td>05/05/2002 Rotate the International Space Station</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Mary Ellen</td>
<td>Weber</td>
<td>Picture Mission Specia STS-101</td>
<td>19/09/2000 Deliver supplies to the Internati</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Frank</td>
<td>Borman</td>
<td>Picture Commander Apollo 8</td>
<td>22/11/1968 Send a crew of three people into</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Neil</td>
<td>Armstrong</td>
<td>Picture Commander Apollo 11</td>
<td>16/07/1969 Land a manned spacecraft on the</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>John</td>
<td>Young</td>
<td>Picture Commander STS-2</td>
<td>12/04/1991 Launch the shuttle and crew into</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>David</td>
<td>Scott</td>
<td>Picture Commander Apollo 10</td>
<td>26/07/1975 Explore the moon, improved space</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Study the Table in Datasheet View

Students begin by exploring the Space Exploration table in Datasheet View.

1. Look at the column headings in the table. What are the 8 fields in this table?

<table>
<thead>
<tr>
<th>ID</th>
<th>First Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Last Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mission Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Launch Date</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Purpose</td>
<td></td>
</tr>
</tbody>
</table>

2. Fill in the blanks using the words from the Word Bank:

<table>
<thead>
<tr>
<th>datashell</th>
<th>column</th>
<th>record</th>
<th>information</th>
<th>cell</th>
<th>row</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) A table contains information organized in rows and columns.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) A table displays information in datasheet view.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Datasheet view allows a person to focus on more than one record at a time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Information for each field is added into a cell.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) In a table a field is organized in a column.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) In a table a record is organized in a row.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Open the Mission Form

You may find it easier to read the information from the Mission table when it is organized in a form. The same information is presented on a sheet.

Next, students investigate Form View.

From the Navigation Pane, double-click mission under the Forms category.

Look at the form. It is in Form View.

Study the Form in Form View

The form shows one record at a time. A form has the fields neatly placed onto the sheet. This makes it easy to view, search, and add new records.

Read to learn more about forms, then answer the questions.

The name of each field appears as a label on the form. Information for each field is added into a control. A control is an object on a form, such as a text box.

A record is made up of fields. Each field is placed on the form in an organized way.
7. Look at labels on the form. What are the 8 fields in this form?

<table>
<thead>
<tr>
<th>ID</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name</td>
<td>Mission Name</td>
</tr>
<tr>
<td>Last Name</td>
<td>Launch Date</td>
</tr>
<tr>
<td>Picture</td>
<td>Purpose</td>
</tr>
</tbody>
</table>

8. Fill in the blanks using the words from the Word Bank:

<table>
<thead>
<tr>
<th>record</th>
<th>label</th>
<th>field</th>
<th>control</th>
<th>form</th>
<th>database</th>
</tr>
</thead>
</table>

a) A collection of data that is stored using Microsoft Access is called a **database**.

b) Information about one space exploration mission is called a **record**.

c) The smallest piece of information in a record is called a **field**.

d) A **label** tells the name of a field.

e) The box where data is entered is called a **control**.

f) A **form** has controls that are neatly placed onto the sheet to look nice.

9. What are some benefits to viewing information in a form?

- easy to see all the information for a record on one screen
- easy to see information in a field that has a lot of text such as purpose
- can see pictures

10. What is a problem with viewing information in a form?

- only see one record at a time

Critical thinking is developed as students compare viewing data in a table and in a form.

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Assignment 5: Filter Records in a Database

Using the Navigation buttons to find a record can become time consuming. There is a faster way to search a database. A search is also called a filter or a query. There are several ways that you can filter the records.

Open the Mission Form in the Space Exploration Database

Students learn database skills as they filter records to find specific information.

In the early 1960’s NASA wanted to send a manned spacecraft into space and have it orbit the Earth. John Glenn was the first person to orbit the Earth. His spacecraft was called Friendship 7. Use the search box to find the record to learn more about the mission.

▷ Type friendship 7 into the Search Box. Search
▷ The first record with the word friendship 7 shows up in the document pane.

1. Read the record and then answer the questions.
   a) How many times did John Glenn orbit the Earth? 3
   b) What was the name of the space program? Mercury
   c) What was the date of the mission? 2

First, the Search box is used to find records.
Use Selection to Find Records about the Gemini Program

If you want to find more than one record that matches a term you need to use Selection. Selection is a command that filters the records to show only those that match the search term.

The Selection command is another method to search database records.

- The first record with the word *gemini* shows up in the document pane.
- Now from the Home tab, click Selection 👨 in the Sort & Filter group.
- From the list, pick Begins with "Gemini".
- Look at the Filter Indicator. It is now pink to show that the records are filtered. Look at the Navigation Bar. There are only two records.

| Record: 1 of 2 | Filtered | gemini |

2. Use the navigation buttons to view the records. Read each record and then answer the questions.

a) What was the mission name of the first manned Gemini flight? **Gemini 3**

b) Who was the command pilot on the first manned Gemini flight? **Virgil "Gus" Grissom**

c) One of the goals of the Gemini program was to put astronauts into space for longer periods of time.

What is the launch date of the Gemini 4 mission? **03/06/1965**

What is the landing date of the Gemini 4 mission? **07/06/1965**

How many days did the Gemini 4 mission last? **4 days**

- Remove the filter by clicking the filter indicator.

| Record: 1 of 2 | Filtered | gemini |

- It should now say Unfiltered.
Use Selection to Find Records about the Apollo Program

Selection is a great way to filter records. Use your skills to learn more about NASA’s Apollo program.

Once NASA was able to send a person into orbit and have them safely land back on Earth, the goal of the space program changed again. This time, NASA wanted to send a three-manned spacecraft to the moon. There are records in the database about the Apollo program. Use Selection to find the records to learn more about some of the Apollo missions.

▷ Type apollo into the Search box.
▷ The first record with the word apollo shows up in the document pane.
▷ Click Selection. From the list, pick Begins with "Apollo".
▷ Look at the Filter Indicator. It is now pink to show that the records are filtered. Look at the Navigation Bar. There are only six records.

| Record: 1 | of 6 | Filtered | apollo |

3. Use the navigation buttons to view the records. Read each record and then answer the questions.

a) What mission was the first manned lunar landing?  
   Apollo 11

b) On one of the Apollo missions, an oxygen tank blew up and the crew had to make an emergency plan to safely return to earth.
   What was the name of the mission?  
   Apollo 13

c) During Apollo 15, astronauts used a lunar roving vehicle to drive along the surface of the moon.
   What part of the moon was the crew exploring?  
   Taurus-Littrow

d) In 1972, the crew collected 240 pounds of rocks during three moonwalks.
   What part of the moon was the crew exploring?  
   Taurus-Littrow

▷ Remove the filter.

Students practice using the Selection command. They discover many facts about space exploration as they complete each search.

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**Use Your Skills to Filter Records in the Database**

Students are challenged to test their filtering skills using the *Manned Maneuvering Units* (MMU).

Filter the records to answer the questions about the Manned Maneuvering Units.

a) What is a Manned Maneuvering Unit?

   *rocket pack that snaps onto the back of the spacesuit*

b) What is the name of the astronaut who wore the MMU in the mission 41-B?

   *Robert Stewart*

7. Exploring space helps people on Earth. For example, many people are worried about the loss of Earth's ozone layer. The ozone layer protects the planet from the Sun's rays. Several space missions have been used to collect information about the *ozone* layer.

a) What is the name of one of the missions that were used to collect information about the Earth's ozone layer?

   *STS-56 or STS-66*

8. Microgravity is when the force of gravity is so weak that objects are weightless. Many studies done in space have been about microgravity. Scientists want to know how to grow plants and build objects in space. They also want to understand how *microgravity* affects humans and animals.

a) What mission on microgravity is most interesting to you?

Learning these skills prepares students for the next sessions in which students build their own table, form, and report.
Session 1 Review: About Databases

Review lessons at the end of sessions provide activities to check and reinforce newly learned skills, concepts, and terminology.

TechnoKids projects consist of six sessions.

Match the database terminology to the definition.

1. B database
2. D form
3. A record
4. E field
5. F table
6. G control
7. C cell

D. a sheet used to neatly arrange fields to make the information easy to view, add, or edit
E. the smallest item or piece of information in a database
F. a datasheet made up of rows and columns that stores data in the database
G. an object on a form

Describe how a database can be used to organize information.

8. A store owner offers movie rentals to customers. How can a database help the store owner?

A database can store customer contact information and movie information.
A database can store which customer has rented a movie title.

9. A library lends books to people. How can a database be used by a library?

A database can store contact information about cardholders and book information.
A database can store which person has borrowed a book title.

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Session 1 Skill Review: More About Space Missions

Skill Reviews are activities for students to practice the technical skills learned in the previous session.

3. Use your skills to filter records to answer the questions about the space missions.

   a) Alan Shepard was the first American to go into space. On May 5, 1961, his spacecraft was launched 116 miles into the air to reach suborbital flight. Several years later Alan flew to the moon on Apollo 14.

      What was the name of the capsule that reached suborbital flight?  
      Freedom 7


      What was the launch date of the Apollo 11 mission?  
      17/07/1969

      What was the landing date of the Apollo 11 mission?  
      24/07/1969

      How many days did the Apollo 11 mission last?  
      8 days

   c) Sally Ride was the first American women in space as a crewmember of STS-7. Her second space mission was a year later on board the Challenger shuttle. Sally has spent more than 343 hours in space.

      What was the launch date of the STS-7 mission?  
      18/06/1983

   d) Guion Bluford was the first African American man in space. Guion was a trained pilot for the U.S. Air Force. Guion joined NASA in 1979. He logged over 688 hours in space during four missions including STS-8, STS 61-A, STS-39, and STS-53.

      What was Guion’s job title on the STS-8 mission?  
      mission specialist

   e) Ulf Merbold was the first astronaut from the European Space Agency (ESA) to fly in space. He was the payload specialist during the first flight of the Spacelab module, which is a reusable laboratory flown into space on the shuttle.

      What experiments were done on the STS-9 mission?  
      microgravity

   f) Marc Garneau was the first Canadian in space. He logged over 677 hours in space on missions STS 41-G, STS-77 and STS-97.

      What was the launch date of the 41-G mission?  
      05/10/1984

Some pages have been removed from this sample.
Session 1 Extension Activity: Sort and Find Records

Extension Activities at the end of sessions provide optional enrichment challenges. 

3. Click the mouse inside the ID column.
   Click Descending on the Home tab.
   What happens? The records are organized from the highest ID number to the lowest.
   Click Ascending on the Home tab.
   What happens? The records are organized from the lowest ID number to the highest.

4. Click the mouse inside the Last Name column.
   Click Descending on the Home tab.
   What happens? The records are organized from Z to A.
   Click Ascending on the Home tab.
   What happens? The records are organized from A to Z.

5. Click the mouse inside the Launch Date column.
   Click Descending on the Home tab.
   What happens? The records are organized from the latest date to the earliest.
   Click Ascending on the Home tab.
   What happens? The records are organized from the earliest date to the latest.

6. Close the Mission table. If asked to save changes, click No.

7. Open the Mission form.

8. Use the Ascending and Descending commands on different fields in the form.
   What field do you prefer to sort records?

Some pages have been removed from this sample.