

Computing Fundamentals Module

Lesson 19 — Using Technology to Solve Problems

Computer Literacy BASICS



Objectives

- Define problem solving.
- Identify technology tools for solving problems.
- Identify problem-solving steps.
- Identify fundamental concepts of software applications including word processing, spreadsheets, databases, graphics and multimedia, and presentation software.

Objectives (cont.)

- Explain how computer software can be used to solve problems.
- Explain how other forms of technology are used to solve problems.

Vocabulary

- Database
- Database software
- Distance learning
- Graphics software
- Multimedia software
- Personal information management software (PIMS)
- Presentation software
- Problem solving

Vocabulary (cont.)

- Relational database
- Search engines
- Spreadsheet
- Spreadsheet software
- Technology
- Telecommunications
- Teleconferencing
- Word-processing software

Problem Solving with Technology

- *Technology* is the application of scientific discoveries to the production of goods and services to improve the human environment.
- Technology provides tools for business operations and individuals' daily lives.
- Computers are playing a major role in the technology boom.

Defining Problem Solving

- *Problem solving* is a systematic approach of going from an initial situation to a desired situation that is subject to some resource constraints.
- **Logical guidelines** must be followed to identify the situation and find the best technology to apply to the situation.

Problem-Solving Steps

1. Define the problem.
2. Investigate and analyze the problem.
3. Identify possible solutions.
4. Select and implement a solution.
5. Evaluate solutions.

Define the Problem

- Make certain that there really is a problem and identify what it is.
- Clarify the **current situation** and identify what it should be.

Investigate and Analyze the Problem

- Collect all available data about the problem.
- This provides the information you need to make an **accurate decision**.
- Sometimes this step reveals that there is no actual problem or that the problem is being caused by something else.

Identify Possible Solutions

- Once the problem is defined and analyzed, consider what can be done to solve it.
- See what can be done differently or what can be added or removed to the situation to fix the problem.
- At this stage, you may identify **several possible solutions**.

Select and Implement a Solution

- If multiple solutions are available, **compare** and test each one to determine the **best possible choice**.
- When you have determined the best solution, **implement** it to fix the problem.

Evaluate Solutions

- After implementing the chosen solution, **analyze** it to be sure that it has solved the problem.
- Ask questions to assess the solution:
 - Did the solution eliminate the problem?
 - Did it accomplish the required task?
- If your answers are positive, you have a solution to the problem.

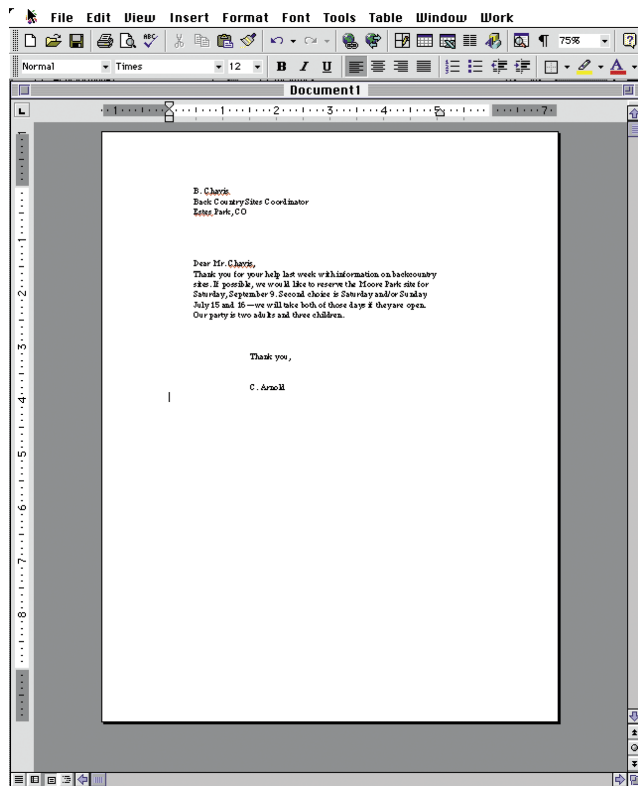
Using Technological Tools to Solve Problems

- Individuals and businesses face problems every day that can be solved by technology.
- Many software programs can be used to solve problems.
- Choose the best software application for the task you want to accomplish.
- The Internet can be used to solve many problems.

Typical Software Applications

- Word processing
- Spreadsheet
- Database
- Presentation
- Graphics
- Multimedia
(animation, digital video, sound)
- Telecommunications
- Web browsers and Web design
- Personal information management
- Specialized programs for specific jobs

Word Processing Software



- Word-processing programs can be used to prepare newsletters, reports, and tables to organize and distribute important information.

A document created with word-processing software

Spreadsheet Software

- Spreadsheets are designed to **store and manipulate numeric data**.
- Spreadsheet programs can be used to quickly create a **budget** or analyze sales.

A spreadsheet prepared electronically

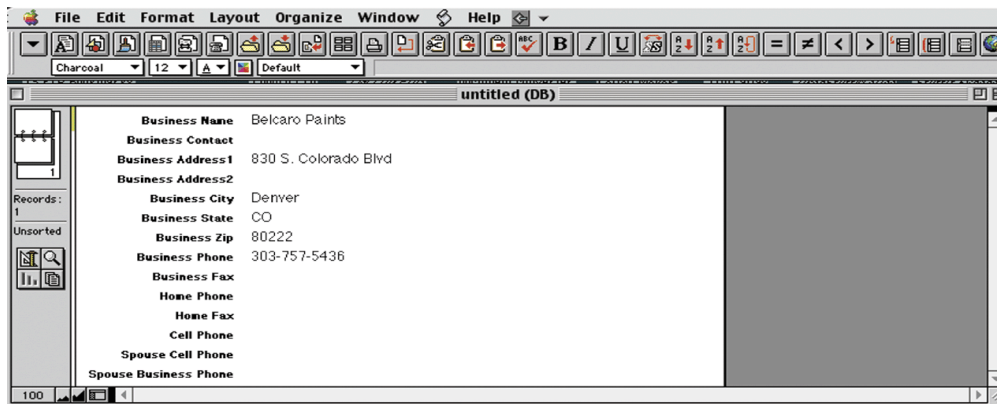
The screenshot shows a spreadsheet titled 'Loan Amort' with the following data:

Input Data		Loan Details	
Selling Price	\$20,150.00	Loan Amount	\$16,150.00
\$ Down Payment	\$4,000.00	Interest RATE	7.90%
% Down Payment	19.85%	Length of Loan (Years)	5.00
Monthly Int & Prin Payment	\$326.69	Yearly Taxes	\$0.00
Total Monthly Payment	\$326.69	Condo Fee or Ins./PMI	\$0.00

Period (Mos.)	Principal	Cum. Principal	Interest	Cum. Interest	Total Cum. Pmts.
1	\$220.37	\$220.37	\$106.32	\$106.32	\$326.69
2	\$221.82	\$442.19	\$104.87	\$211.19	\$653.38
3	\$223.28	\$665.47	\$103.41	\$314.60	\$980.07
4	\$224.75	\$890.23	\$101.94	\$416.54	\$1,306.77
5	\$226.23	\$1,116.46	\$100.46	\$517.00	\$1,633.46
6	\$227.72	\$1,344.18	\$98.97	\$615.97	\$1,960.15
7	\$229.22	\$1,573.40	\$97.47	\$713.44	\$2,286.84
8	\$230.73	\$1,804.13	\$95.96	\$809.41	\$2,613.53
9	\$232.25	\$2,036.37	\$94.44	\$903.85	\$2,940.22
10	\$233.78	\$2,270.15	\$92.91	\$996.76	\$3,266.91
11	\$235.32	\$2,505.47	\$91.38	\$1,088.14	\$3,593.61
12	\$236.86	\$2,742.33	\$89.83	\$1,177.97	\$3,920.30
13	\$238.42	\$2,980.75	\$88.27	\$1,266.23	\$4,246.99
14	\$239.99	\$3,220.75	\$86.70	\$1,352.93	\$4,573.68
15	\$241.57	\$3,462.32	\$85.12	\$1,438.05	\$4,900.37
16	\$243.16	\$3,705.49	\$83.53	\$1,521.58	\$5,227.06
17	\$244.77	\$3,950.25	\$81.93	\$1,603.50	\$5,553.75
18	\$246.38	\$4,196.63	\$80.32	\$1,683.82	\$5,880.45
19	\$248.00	\$4,444.63	\$78.69	\$1,762.51	\$6,207.14
20	\$249.63	\$4,694.26	\$77.06	\$1,839.57	\$6,533.83
21	\$251.27	\$4,945.53	\$75.42	\$1,914.99	\$6,860.52
22	\$252.93	\$5,198.46	\$73.76	\$1,988.75	\$7,187.21
23	\$254.59	\$5,453.05	\$72.10	\$2,060.85	\$7,513.90
24	\$256.27	\$5,709.32	\$70.42	\$2,131.27	\$7,840.59
25	\$257.96	\$5,967.28	\$68.73	\$2,200.00	\$8,167.29
26	\$259.66	\$6,226.94	\$67.04	\$2,267.04	\$8,493.98
27	\$261.36	\$6,488.30	\$65.33	\$2,332.37	\$8,820.67
28	\$263.09	\$6,751.39	\$63.61	\$2,395.97	\$9,147.36
29	\$264.82	\$7,016.20	\$61.87	\$2,457.85	\$9,474.05
30	\$266.56	\$7,282.76	\$60.13	\$2,517.98	\$9,800.74
31	\$268.32	\$7,551.08	\$58.38	\$2,576.35	\$10,127.43
32	\$270.08	\$7,821.16	\$56.61	\$2,632.96	\$10,454.12
33	\$271.86	\$8,093.02	\$54.83	\$2,687.80	\$10,780.82
34	\$273.65	\$8,366.67	\$53.04	\$2,740.84	\$11,107.51
35	\$275.45	\$8,642.12	\$51.24	\$2,792.08	\$11,434.20
36	\$277.26	\$8,919.39	\$49.43	\$2,841.50	\$11,760.89
37	\$279.09	\$9,198.48	\$47.60	\$2,889.11	\$12,087.58
38	\$280.93	\$9,479.40	\$45.76	\$2,934.87	\$12,414.27
39	\$282.78	\$9,762.18	\$43.91	\$2,978.78	\$12,740.96
40	\$284.64	\$10,046.82	\$42.05	\$3,020.84	\$13,067.66
41	\$286.51	\$10,333.33	\$40.18	\$3,061.02	\$13,394.35
42	\$288.40	\$10,621.73	\$38.29	\$3,099.31	\$13,721.04
43	\$290.30	\$10,912.03	\$36.39	\$3,135.70	\$14,047.73
44	\$292.21	\$11,204.23	\$34.48	\$3,170.19	\$14,374.42
45	\$294.13	\$11,498.37	\$32.56	\$3,202.75	\$14,701.11
46	\$296.07	\$11,794.43	\$30.62	\$3,233.37	\$15,027.80

Database Software

- Database software can organize, store, and retrieve large amounts of data and create queries to locate specific data.
- A *relational database* is a collection of database tables that are connected to each other.

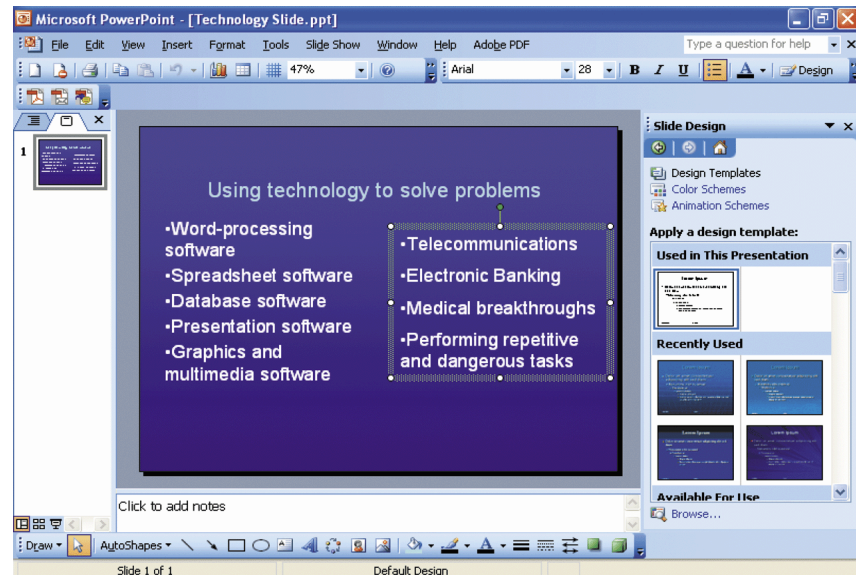


A database document used to organize a list of customers

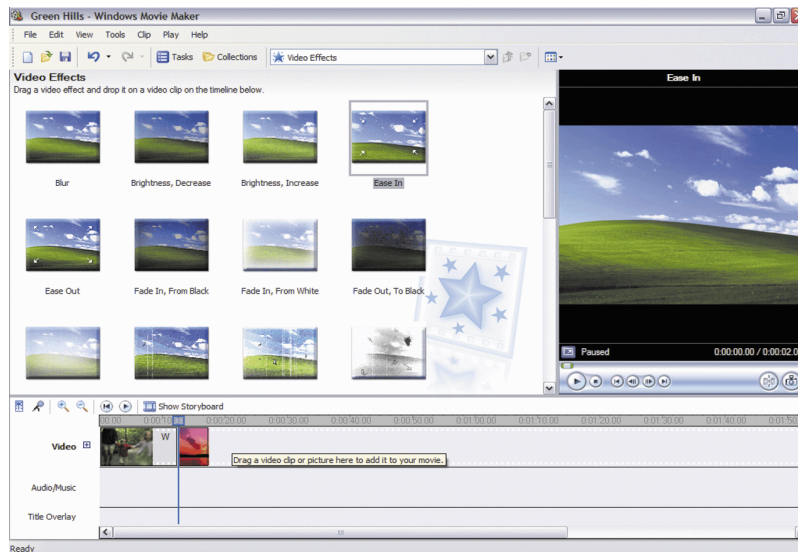
Presentation Software

- Businesses and individuals use presentation software to create automated slide shows.

Creating a
slide with
presentation
software



Graphics and Multimedia Software



You would use multimedia software to edit digital video on a computer monitor.

- Graphics software is used to create images electronically.
- Different kinds of multimedia software can be used to manipulate digital photographs, video, and sound files.

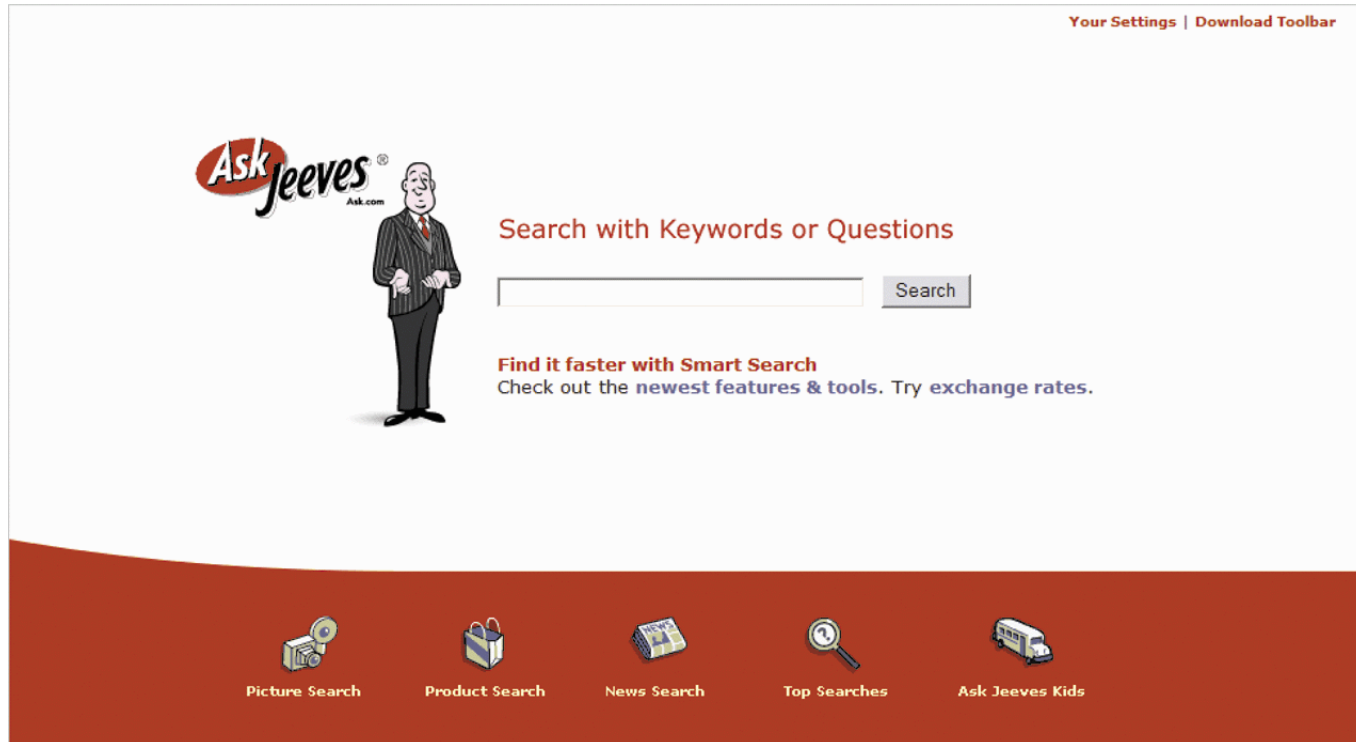
Telecommunications

- *Telecommunications* refers to the electronic transfer of data.
- Telecommunications software allows computers across the country to talk with each other.
- This capability is used extensively in the fields of **distance learning** and **teleconferencing**.

Use the Internet to Solve Problems

- **E-mail** allows users around the world to communicate almost instantly.
- Networking and electronic research tools allow users to collect and analyze data.
- **Search engines** allow you to enter a keyword or phrase and will search millions of Web sites to find the information you are seeking.

An Internet Search Engine



Web Software

- **Browser software** allows users to view Web pages and move from one Web site to another.
- Software is also available to simplify the process of **creating Web sites**.

Other Software Programs

- Personal information management software (**PIMS**) is used to organize appointments, meetings, telephone and contact information, projects, and tasks to be completed.
- There are many software programs available to solve a problem in a particular area or field of interest including **real estate, medical offices, construction**, and so on.

Integrated Application Software

- An integrated software package or suite **combines different productivity applications into one package.**
- Integrated software applications allow you to transfer data easily from one program to another.
- Microsoft Office, AppleWorks, and the Corel Graphics suite are **examples of integrated applications.**

Other Technologies Used to Solve Problems

- **Entertainment:** Computer games can teach problem-solving skills, and **simulations** allow you to experiment with **real-life situations**.
- **Electronic banking:** It allows customers to bank whenever it is convenient for them.
- **Medical and health care:** Computers and electronic devices are used extensively in hospitals to monitor patients' health.

Other Technologies Used to Solve Problems (cont.)

- **Dangerous tasks:**
Computers and robots are increasingly being used for tasks that would be very risky for a human to attempt.
- **Repetitious tasks:**
Computers can do repetitive work accurately without getting tired or making mistakes.



Computers can perform tasks in environments too dangerous for humans.

Summary

- Technology has made a great impact on our lives.
- The computer plays a major role in the technology boom.
- Computer software controls the versatility of the computer.

Summary (cont.)

- Problem solving involves defining a problem and finding a solution.
- The sequence of problem solving includes defining the problem, investigating and analyzing the problem, identifying possible solutions, selecting and implementing the best solution, and evaluating the chosen solution.

Summary (cont.)

- Typical software programs, such as word processing, spreadsheet, database management, presentations, graphics, multimedia, and telecommunications, are used to solve problems.
- The Internet offers electronic communication, distance learning, teleconferencing, networking, and electronic research tools to solve problems.

Summary (cont.)

- Other technology, including devices with microprocessors, has affected our lives by providing solutions to problems and situations in the areas of entertainment, medicine, banking, and the performance of dangerous and repetitious tasks.