This secondary unit of instruction on data processing is one of sixteen Common Core Units in Business Education (CCUBE). The units were designed for implementing the sixteen common core competencies identified in the California Business Education Program Guide for Office and Distributive Education. Each competency-based unit is designed to facilitate personalized instruction and may include five types of materials: (1) a teacher's guide, which provides specific strategies for the units as well as suggestions for the use of the materials; (2) a student manual, which directs the student through the unit's activities and jobs and brings the student to the competency level for the unit; (3) working papers, which are consumable materials used in completing the job and activities described in the student manual; (4) pre/post tests and quizzes; and (5) suggested electronic media. A strategies manual and the California Business Education Program Guide and supplements are also available--see note. (LRA)
DATA PROCESSING AND THE W'S

COMMON CORE UNITS IN BUSINESS EDUCATION
DATA PROCESSING

Written by
EUGENE MUSCAT, Ed.D.
EDP Resource Center
San Francisco Schools

Copyright © California State Department of Education 1977

This document was prepared by the Office of the Contra Costa County Superintendent of Schools in cooperation with the California State Department of Education in a project funded under the Vocational Education Act, Public Law 90-576. The content does not necessarily reflect the position or policy of the U.S. Office of Education, Department of Health, Education, and Welfare, and no official endorsement of that office should be inferred.
Any business student, regardless of their career objective, will face an increasing use of automated equipment. This unit is designed to provide a student with an overview of the vocabulary and equipment common to modern business data processing.

Student experiences will include:

- A pre-test to determine student needs.
- A slide tape presentation to provide a clear understanding of the nine data processing operations.
- Five student note sheets to reinforce the visual presentation.
- A field study exercise (W)5 to demonstrate student awareness of common data processing practices.
- An audio tape to assist students in preparing their (W)5 report.
- A post-test review to assess student progress.

The following hints are provided only as a guide for teacher preparation.

**PRE-TEST**

Prior to administering the pre-test express the attitude that most students know a good deal more about data processing than they think. This should insure that students will approach the topic with a realistic (non technical) attitude. Use the left answer column for the pre-test, score and store the results for the post-test review.
SLIDE TAPE

Students may wish to view the slide tape in teams. Advise them to consider it a "field trip" experience that should be viewed carefully. The major concepts are clearly portrayed in each business setting. They should be prepared for a variety of sights and sounds related to business data processing.

NOTE SHEETS

Each student should be provided with the appropriate tape prior to viewing the slide tape. If two or more students view the film together one might act as the recorder. The note sheets are for the student's use and need not be collected nor graded.

(W)5 BUSINESS STUDY

It is critical to competency development that each student submit a business study report. Students may wish to expand the one page format to a more thorough review of a local business operation. Two copies of the report are provided to allow for a first draft. The audio tape will give students detailed help but the following hints should be stressed.

(W)5 BUSINESS STUDY HINTS

Remember, YOU are the systems analyst. You must:

- CHOOSE a business
- VISIT and observe
- ASK questions
- RECORD your findings

W1. Look for specific manual, mechanical punch-card or electronic activities.
W2. When are the information deadlines?
W3. Is data sent somewhere?
W4. Collect job titles and descriptions.
W5. What changes would the workers like made?

Remember, there is no one "right" answer. The assignment simply allows a student to demonstrate their understanding of key concepts. Each business is different. Encourage students to share their experiences with their classmates. Review the nine operations reported by each student to detect a lack of understanding.

Remind students that this preliminary report would be turned over to a systems analyst for implementation (if a change was indicated). Students should be given AT LEAST one week to complete their business study.

POST-TEST

A retest should confirm student progress. The key concepts presented in each question are related to the slide tape presentation. The other activities are supportive but not directly related to the test questions.
# Data Processing and the \((W)^5\)

**DIRECTIONS:** The questions below will help you to learn more about data processing. Place your answers on the left the first time (pretest score). Place your answers on the right the second time (posttest score). The slide tape presentation is designed to help you improve your score. If a statement is TRUE, put a circle around the T. If it is FALSE, put a circle around the F. If you do not know if it is TRUE or FALSE, put a circle around the D.

<table>
<thead>
<tr>
<th>T</th>
<th>F</th>
<th>D</th>
<th>T</th>
<th>F</th>
<th>D</th>
<th>T</th>
<th>F</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A systems analyst designs and builds computers.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>There are five operations common to most D.P. systems.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Most businesses use more than one data processing method.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Data processing can be accomplished without machines.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Handwriting can be an input and an output method.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Computing is part of most mechanical data processing systems.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>A system is a set of procedures that change business information.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Carbon paper is often used as a data processing tool.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Continuous form paper is only used in electronic data processing.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Computing can be performed on many mechanical devices.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>The recording operation in punch-card systems is much faster than most mechanical methods.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>There are 88 columns on a standard data processing card.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Data processing cards are divided into groups of columns called sectors.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Computers automatically correct all recording errors.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>GIGO is one of the computer languages used in business.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>The main element of an electronic data processing system is the C.P.U.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Magnetic tape is an off-line storage medium.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>E.D.P. always involves the use of punched cards.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>A computer disk is generally considered an input device.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>All computers can perform many tasks at the same time.</td>
<td>T</td>
<td>F</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**PRETEST**

<table>
<thead>
<tr>
<th>Student Name</th>
</tr>
</thead>
</table>

**POSTTEST**

<table>
<thead>
<tr>
<th>Date</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
There are ___________ methods of data processing.

Data processing is taking _________________ and __________________ them in various ways to make them more ________________.

There are ___________ basic operations that can be found in any office.

The basic operations include:

RECORDING

REPORTING

SORTING

REPRODUCING

COMPUTING

STORING

A ______________________ is a set of procedures or small tasks that change (improve) business information.

Business systems are classified by the processing method:

1. ______________________

2. ______________________

3. ______________________

4. ______________________
Part One, Section 1, continued . . .

AND, AT ARGONAUT REAL ESTATE . . .

A phone request provided ______________________ to the manual data processing system.

Sorting put the requests in ______________________ order by the name of the customer.

NCR (no carbon required) paper was used to make ______________________ automatically.

File cabinets were used for information ______________________.

After you have answered the questions in Section 1, be sure to review the questions in Section 2 before you return to PART ONE of the filmstrip.
DATA PROCESSING
WORKBOOK PAGE 4

WORKSHEET
DATA PROCESSING AND THE (W)5 – PART ONE

Section 2
AT DOCTORS CLINIC, INC. ....

The typewriter was a ______________ recording device.

Computing was done using a ______________________________ or accounting machine.

Patient reports were ____________________________ by using special forms and a copy machine.

Machines were used for jobs that were __________________ and __________________.

After you have answered the questions in Section 2, return PART ONE of the filmstrip and get PART TWO of the filmstrip. Be sure to review the questions in Section 1 of PART TWO of this Worksheet before you begin PART TWO of the filmstrip.
Input data was punched into data processing ________________.

Machine readable input was used repeatedly with less chance of ____________________.

You can record ________________ items (letters or numbers) on data processing cards.

Data processing cards were divided into groups of columns called ____________________.

Alphabetic characters had ________________ hole(s) in each column of a punched card. One in the ________________ and one in the ________________ area.

They used a punched-card ____________________ machine to print the mailing labels.

GIGO means ____________________

Output was produced at over ________________ lines per minute.

After you have answered the questions in Section 1, be sure to review the questions in Section 2 before you return to PART TWO of the filmstrip.
Section 2

AT ON-LINE TICKET...

Each ticket location had its own __________ linked to the central __________.

Information was communicated (transmitted) over _______________ lines.

Their _______________ computer system could handle multiple jobs at the same time.

On-line _______________ was found on disk packs rotating on disk drives.

Magnetic tape (off-line) storage was primarily used for _______________ and _______________ operations.

Punched-card payroll cards were _______________ processed once a week, then paychecks were printed on a _______________.

______________ were hired to prepare instructions for each computer task.

After you have answered the questions in Section 2, return PART TWO of the filmstrip and give all four parts of this Worksheet to your teacher.
PREPARED FOR
(Business Name)

PREPARED BY
(Student Analyst)

DATE
DATA PROCESSING Report

1. WHAT method of processing is this business currently using for:
   (Describe briefly.)
   A. Recording ____________________________
   B. Classifying ____________________________
   C. Storing ________________________________
   D. Computing _____________________________
   E. Sorting ________________________________
   F. Retrieving ________________________________
   G. Reporting ______________________________
   H. Reproducing ___________________________
   I. Communication _________________________

2. WHEN do they require output data?
   Continuously ___  Weekly ___  Yearly ___
   Daily ___  Monthly ___  Other ____________________________

3. WHERE is the data needed?
   Locally ___  Remotely ___  Other ____________________________

4. WHO will process the data?
   (List the job titles.) ____________________________

   HOW MANY EMPLOYEES? ___
   (Total)

5. WHY is a change needed?
   A. Is the information flow:
      Slow ___  Inaccurate ___
      Sporadic ___  Other ____________________________

   B. The current state of data processing is primarily:
      Manual ___  Mechanical ___  Punch-Card ___  EDP ___

   C. Is a change indicated?
      Yes ___  No ___
      Why? ____________________________
W$5$
REPORT

PREPARED FOR
(Business Name)

PREPARED BY
(Student Analyst)

DATE

14
DATA PROCESSING Report

1. WHAT method of processing is this business currently using for:
   (Describe briefly.)
   A. Recording
   B. Classifying
   C. Storing
   D. Computing
   E. Sorting
   F. Retrieving
   G. Reporting
   H. Reproducing
   I. Communication

2. WHEN do they require output data?
   Continuously __  Weekly __  Yearly __
   Daily __  Monthly __  Other ___________________________

3. WHERE is the data needed?
   Locally __  Remotely __  Other ___________________________

4. WHO will process the data?
   (List the job titles.) ___________________________
   HOW MANY EMPLOYEES? __________
   (Total)

5. WHY is a change needed?
   A. Is the information flow:
      Slow __  Inaccurate __
      Sporadic __  Other ___________________________
   B. The current state of data processing is primarily:
      Manual __  Mechanical __  Punch-Card __  EDP __
   C. Is a change indicated?
      Yes __  No __  15
      Why? ___________________________
KEY

DIRECTIONS: The questions below will help you to learn more about data processing. Place your answers on the left the first time (pre-test score). Place your answers on the right the second time (post-test score). The slide tape presentation is designed to help you improve your score. If a statement is TRUE, put a circle around the T. If it is FALSE, put a circle around the F. If you do not know if it is TRUE or FALSE, put a circle around the D.

1. A systems analyst designs and builds computers.
   T F D
   2. There are five operations common to most D.P. systems.
   T F D
   3. Most businesses use more than one data processing method.
   T F D
   4. Data processing can be accomplished without machines.
   T F D
   5. Handwriting can be an input and an output method.
   T F D
   6. Computing is part of most mechanical data processing systems.
   T F D
   7. A system is a set of procedures that change business information.
   T F D
   8. Carbon paper is often used as a data processing tool.
   T F D
   9. Continuous form paper is only used in electronic data processing.
   T F D
   10. Computing can be performed on many mechanical devices.
    T F D
   11. The recording operation in punch-card systems is much faster than most mechanical methods.
    T F D
   12. There are 88 columns on a standard data processing card.
    T F D
   13. Data processing cards are divided into groups of columns called sectors.
    T F D
    T F D
   15. GIGO is one of the computer languages used in business.
    T F D
   16. The main element of an electronic data processing system is the C.P.U.
    T F D
   17. Magnetic tape is an off-line storage medium.
    T F D
   18. E.D.P. always involves the use of punched cards.
    T F D
   19. A computer disk is generally considered an input device.
    T F D
   20. All computers can perform many tasks at the same time.
    T F D

14/20
PRETEST

Student Name

20/20
POSTTEST

TOM LOW

10/15/77 Date 10/30/77
Pretest Posttest
There are 4 methods of data processing.

Data processing is taking facts and changing them in various ways to make them more useful.

There are 9 basic operations that can be found in any office.

The basic operations include:

- RECORDING
  - retrieving
- classifying
- REPORTING
- SORTING
- REPRODUCING
- COMPUTING
  - communicating
- STORING

A system is a set of procedures or small tasks that change (improve) business information.

Business systems are classified by the processing method:

1. manual
2. mechanical
3. punched-card
4. electronic
Part One, Section 1, continued . . .

AND, AT ARGONAUT REAL ESTATE . . .

A phone request provided ______ input ________ to the manual data processing system.

Sorting put the requests in ______ alphabetical ________ order by the name of the customer.

NCR (no carbon required) paper was used to make ______ copies ________ automatically.

File cabinets were used for information ______ storage ______.

After you have answered the questions in Section 1, be sure to review the questions in Section 2 before you return to PART ONE of the filmstrip.
WORKSHEET
DATA PROCESSING AND THE (W)5 – PART ONE

Section 2

AT DOCTORS CLINIC, INC....

The typewriter was a mechanical recording device.
Computing was done using a posting or accounting machine.
Patient reports were reproduced by using special forms and a copy machine.
Machines were used for jobs that were large and repetitive.

After you have answered the questions in Section 2, return PART ONE of the filmstrip and get PART TWO of the filmstrip. Be sure to review the questions in Section 1 of PART TWO of this Worksheet before you begin PART TWO of the filmstrip.
Input data was punched into data processing cards.

Machine readable input was used repeatedly with less chance of error.

You can record 80 items (letters or numbers) on data processing cards.

Data processing cards were divided into groups of columns called fields.

Alphabetic characters had 2 holes in each column of a punched card. One in the digit and one in the zone area.

They used a punched-card accounting machine to print the mailing labels.

GIGO means garbage in

garbage out

Output was produced at over 100 lines per minute.

After you have answered the questions in Section 1, be sure to review the questions in Section 2 before you return to PART TWO of the filmstrip.
DATA PROCESSING AND THE \( W^5 \) — PART TWO

Section 2

AT ON-LINE TICKET . . .

Each ticket location had its own terminal linked to the central processing unit.

Information was communicated (transmitted) over telephone lines.

Their time shared computer system could handle multiple jobs at the same time.

On-line storage was found on disk packs rotating on disk drives.

Magnetic tape (off-line) storage was primarily used for input and output operations.

Punched-card payroll cards were batch processed once a week, then paychecks were printed on a line printer.

Programmers were hired to prepare instructions for each computer task.

After you have answered the questions in Section 2, return PART TWO of the filmstrip and give all four parts of this Worksheet to your teacher.
1. WHAT method of processing is this business currently using for:

(Describe briefly.)
A. Recording ______ handwritten entries some typing (manual)
B. Classifying ______ color code forms for homes, apt., stores (manual)
C. Storing ______ file folders and cabinets (manual)
D. Computing ______ printing calculator (mechanical)
E. Sorting ______ hand assorting (manual)
F. Retrieving ______ hand searches (manual)
G. Reporting ______ typewritten (mechanical)
H. Reproducing ______ carbon paper and a copy machine (mechanical)
I. Communication ______ U.S. Mail and telephone (manual)

2. WHEN do they require output data?

Continuously _____ Weekly _____ Yearly XX
Daily _____ Monthly XX Other

3. WHERE is the data needed?

Locally XX Remotely _____ Other ______ Real Estate Association

4. WHO will process the data?

(List the job titles.) Office Manager
Payroll Clerk

HOW MANY
EMPLOYEES? 7
(Total)

5. WHY is a change needed?

A. Is the information flow:

Slow XX Inaccurate ___
Sporadic ___ Other Sales trends not measured.

B. The current state of data processing is primarily:

Manual XX Mechanical ____ Punch-Card ____ EDP ___

C. Is a change indicated? XX

Yes XX No ___

Why? More mechanical aids are needed. Suggestions include: an automatic typewriter (communicating); a calculator with memory (calculating) and a banking service computerized payroll.