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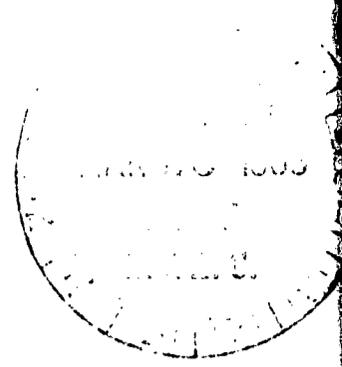
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The major topic is the modular scheduling program developed for Virgin Valley High School in Mesquite, Nevada. The concept of modular units in curriculum planning is described with various modular units illustrated graphically. Also included is an example of a hand-generated modular schedule system which is adaptable in schools with a 200- to 33 with a 200- to 300-student population. A bibliography of publications relevant to modular scheduling is appended. The report is disseminated by Title III funds of the Elementary and Secondary Education Act. A related document is RC 003 298. (EV)

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C L A R K C O N T Y S C H O O L D I S T R I C T

VIRGIN VALLEY HIGH SCHOOL
"Biggest Little School In America"

S C H E D U L I N G

Blaine W. Allan, Principal
Mesquite, Nevada
89024

Disseminated by Title III Project

1967

062003290

"The schedule can be changed from master of the curriculum to servant of the teacher"

Virgin Valley High School, Mesquite, Nevada, is one of seven high schools in the Clark County School District which comprises all of Clark County, Nevada. The District covers an area of 8,000 square miles, has a school population of 62,000 students, and employs upwards of 2,500 classroom teachers. Virgin Valley School has an enrollment of 365 (K-12) and operates on a 6-6 plan. The high school, accredited by Northwest Association each year since 1939, has 165 students. The staff includes fourteen teachers in the high school and eight in the elementary with a special education teacher and a full-time librarian. Sixty-five to seventy percent of the graduates continue their education with approximately half of them completing college graduate work.

Several years ago the faculty and administration began to question traditional school organizational and instructional practices with respect to what is known about how children learn. This led to numerous studies, course work, consultation with university professors, reflective thinking, faculty meetings, action research with the eventual conclusions that there may be better ways to match teaching and learning. Early in the fall of 1963, the Virgin Valley Schools started experimenting with modular scheduling, using the computerized technique developed by the Secondary School Project of Stanford University and other progressive educators. The Western States Small Schools Project (WSSSP), the Stanford Secondary School Project, and the administration of the Board of School Trustees of the Clark County School District have made Virgin Valley an innovative school. It was one of the four pilot schools selected by Stanford University to pioneer flexible scheduling and curriculum study. Virgin Valley is using a 30 minute module with a total of 80 modules per week.

In addition to the modular schedule, Virgin Valley has sponsored a local fine arts festival for eight successive years with participating artists and schools from throughout the inter-mountain west. Each year guest artists lecture and demonstrate to students and school patrons in some aspects of fine arts. The school is very proud of the success of its "Art by Telephone" class taught by art teacher, Michael Clarke. The class has received the national "Pacemaker" award for innovations in teaching. The Virgin Valley vocational department is piloting a program in connection with the modular schedule and vocational areas related to agriculture. It has also planned to provide some of the students with on-the-job training experience. This Career Selection Program has as its goals: (1) To direct each student in developing a realistic self-appraisal with respect to his interests, his abilities, and his opportunities in the world of work; (2) To help prepare the non-college bound student for suitable entry work at the end of high school graduation; and (3) To involve the entire school faculty and community in achieving goals one and two.

These innovative practices were given policy direction by the Clark County Board of School Trustees. I/D/E/A's national organization and network, along with the Western States Small Schools Project, assists in planning and implementation of these programs.

The need to recognize individual differences and make essential changes to meet them is a pressing need in any school and toward which the Virgin Valley Schools have directed a great deal of effort.

Within a small school is to be found the potential flexibility to do many of the things necessary to accommodate individual differences: Classes are small; the teachers and students know each other well; the programs are more easily adjusted; and schedules are not difficult to change. Our school has attempted to capitalize upon these potential strengths in developing new practices that would provide better opportunities for students to pursue individual interests, satisfy individual needs and develop individual talents.

DEFINITIONS OF TERMS

Modular Scheduling: "A modular concept of course structure is based on the premise that those involved with curriculum planning can determine explicitly what kind of specific learning activities students need to have. The modular concept is then adapted in such a manner that facilitation of those elements (namely: organization of course structure, number of students involved in specific groups, teacher-pupil ratio and specific time allocations) associated with the learning activities become manageable."

Large Group Instruction: "Any activity in which the learner is involved where he is quasi-active - - listening to a lecturer, filling in a learning program, viewing a film, or taking a test - - can go on in a large assembly group, as well as in any other group size. While these groups are referred to as large groups, it is not their size, but their function which is significant....."

Small Group Instruction: "The second learning group is the one in which the student questions, discusses, clarifies, proposes, and uses his ideas and knowledge. Of necessity this group must be small, generally with only seven to fifteen students. Any more participants in this group would rob the individual of adequate opportunity to discuss and question.....A group this size is manageable in discussion and free enough for questioning. While these groups have been popularly called small groups, it might be helpful to think of them as inquiry groups."

Independent Study: "The third learning activity, and perhaps the most significant, is independent study. Usually independent study is the business of one person, although sometimes two or three work together profitably. This is an informal activity, not scheduled on a regular basis but open for the student to set and use as he sees fit."

Laboratory Group Instruction: "Laboratory as here defined includes those physical facilities for which special equipment and tools are needed to enable students to work independently and in small groups and to practice skills, to experiment, and to apply ideas suggested in large-group instruction....."

Hand Generated: The method used to make a modular schedule by hand. No computer is employed to make the computations. The person making the schedule must eradicate the conflicts that exist and assemble the schedule from the information supplied by the teachers.

BUILDING A MODULAR SCHEDULE

INTRODUCTION

An explanation has been developed by Dr. Dwight W. Allen¹ of the step-by-step development of the modular scheduling concept; a knowledge of this basic concept is necessary in the construction of a modular schedule.

I. DEVELOPING A MODULAR CONCEPT OF COURSE STRUCTURE

Tradition has led us to assume that each class offering is structured like every other class offering, i.e., each class is composed of thirty students and meets about fifty minutes daily. Little variation has evolved from this basic format of secondary education established over one hundred years ago in the Boston Grammar School. Nevertheless, educators will agree that all curricular offerings should be taught in a manner which maximizes the ability to learn - - and that this probably is not possible for all subjects in the same structural format.

The purpose of the accompanying worksheets and examples is to help conceptualize a new approach to course structure - an approach built upon the concept of a modular schedule with the assumption that widely variant course structures are appropriate.

A modular concept of course structure is predicated on the premise that those involved with curriculum planning can determine explicitly what kinds of specific learning activities students need to have. The modular concept is then adapted in such a manner that the facilitation of those elements (namely: organization of course structure, number of students involved in specific groups, teacher-pupil ratio and specific time allocations) associated with the learning activities becomes manageable.

II. THE CURRICULUM MAY BE CONSIDERED A FUNCTION OF AREA

The entire curriculum can be thought of as an area to be scheduled. The horizontal dimension represents the number of students, the vertical dimension represents the length of time. If the school has eighteen hundred students and the school day lasts from 8 A.M. to 4 P.M., the curriculum area is divided horizontally and vertically. This is shown in Figure 1.

¹ Dr. Dwight W. Allen, Assistant Professor of Education, Stanford University.

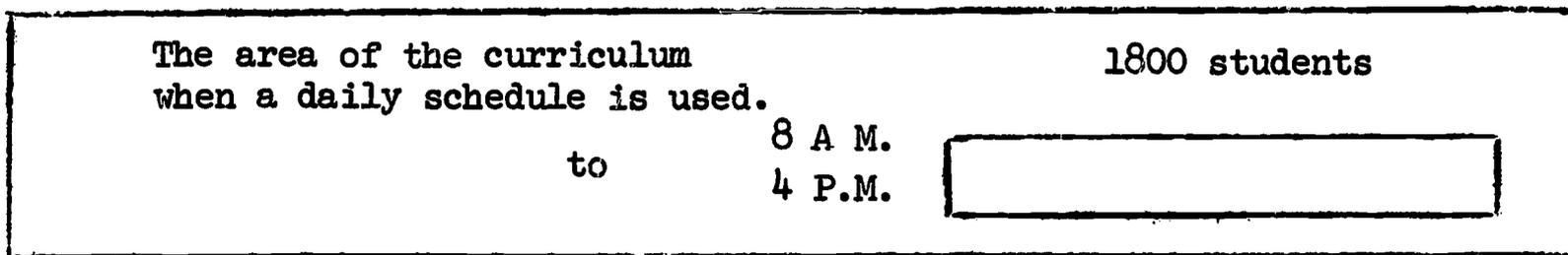


FIGURE 1. Curriculum Area

If a weekly schedule is used, the curriculum area is expanded. This is shown in Figure 2.

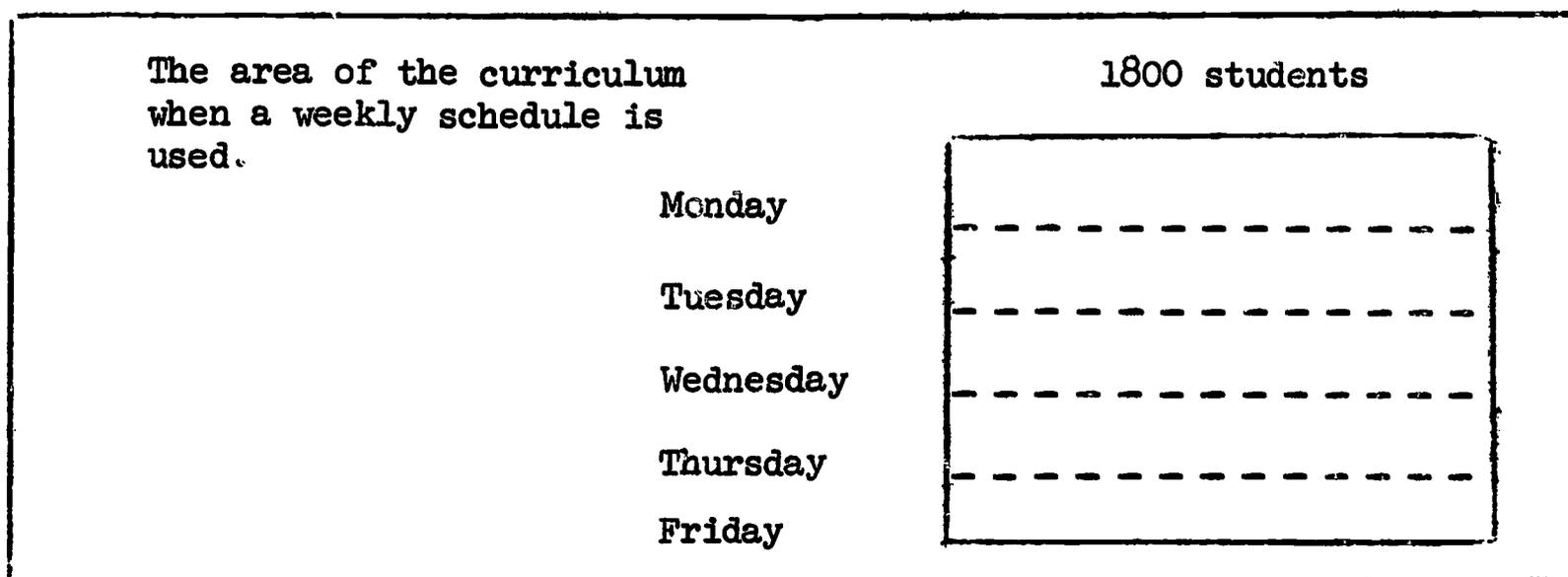
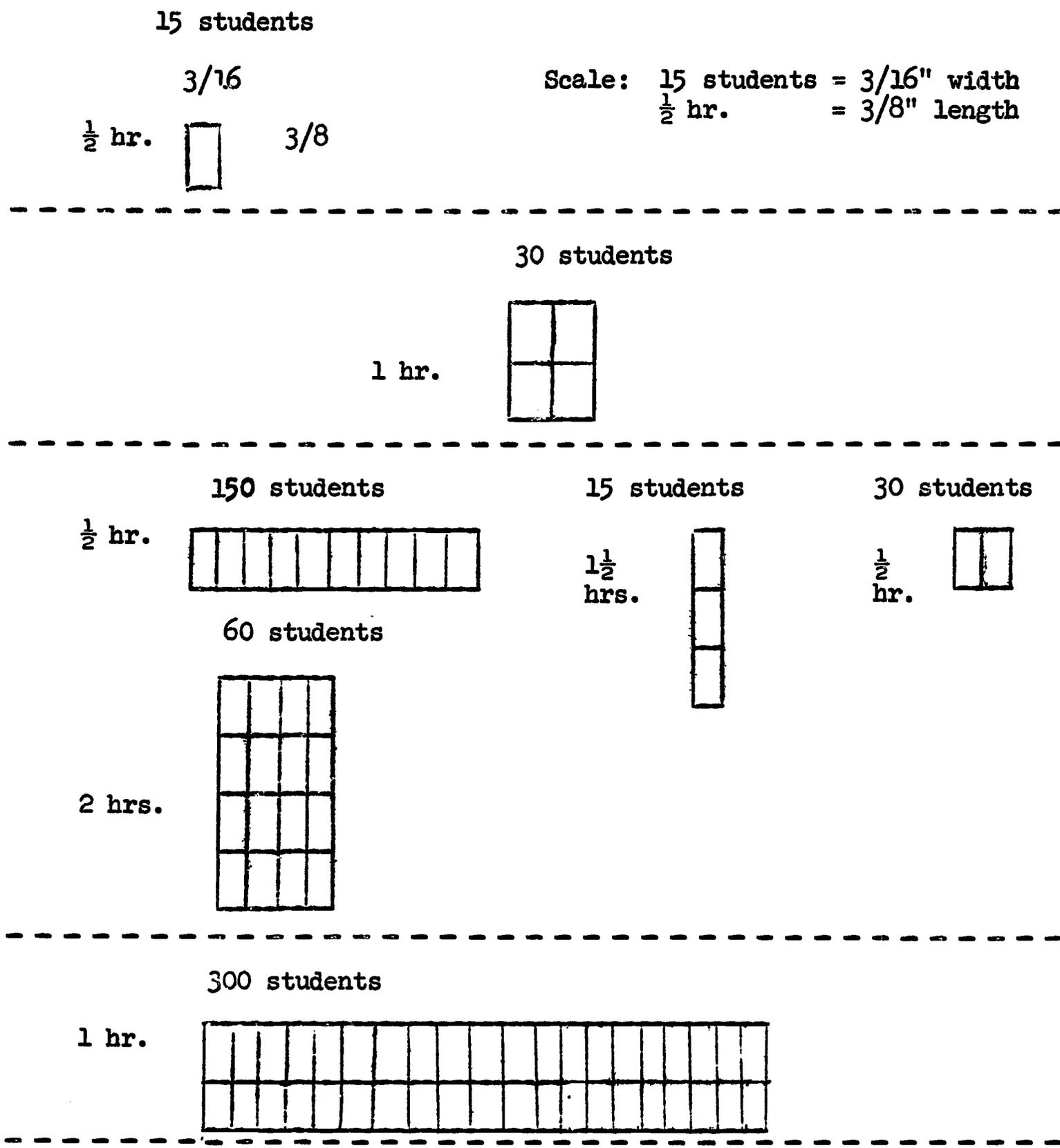


FIGURE 2. Curriculum Area Expanded

III. THE CONCEPT OF MODULAR UNITS IN CURRICULUM PLANNING

The curriculum, conceived as an area to be scheduled, is made up of sub-parts called modular units which are derived from units of time and numbers of student schedules. The modular unit chosen for time should be chosen according to the smallest amount of time that is desired for any instructional purpose. If 40 minute, 60 minute, or 120 minute classes are desired, a 20 minute module would be appropriate. The number of students selected should be also stated in terms of desired class sizes. A ten-student module would accommodate classes of 10, 20, 30, 40, etc. Though any modular unit can be selected for either period length or class size, it is desirable to select as large a modular unit as appropriate to reduce the complexity of scheduling.

One possible modular unit is that of 15 students meeting for a single half hour period. Thus a "class" of 30 students meeting for an hour (conventional class unit) would appear as a multiple of the modular unit. A wide variety of structures is possible, as being multiples of the basic modular unit. These different modular arrangements are shown in Figure 3.



Note that many other basic modular units are possible:

- | | | |
|-------------|-----|------------|
| 5 students | | 10 minutes |
| 10 students | | 15 minutes |
| 15 students | for | 20 minutes |
| 30 students | | 30 minutes |
| 50 students | | 60 minutes |
| etc. | | etc. |

FIGURE 3. Development of Modular Units

Modular units that have been considered by school districts for planning are:

15 students for 30 minutes
15 students for 20 minutes
30 students for 15 minutes
15 students for 25 minutes
10 students for 10 minutes

The smaller the modular units, the greater the flexibility - - but also the greater the complexity.

MODULAR SCHEDULES - HAND GENERATED

by Blaine W. Allan & L. Leon Webb

Modular scheduling has had several modifications since its birth in the early sixties. The first schedules labeled "modular" were generated by making use of the facilities a computer had to offer. Because of the present exorbitant cost (from \$5.00 per student and up) of scheduling students through the use of a computer, a more efficient and less expensive manner of scheduling is needed. Hand generation of a modular schedule meets both of these criteria in a 200 to 300 student school.

After having a computer generated modular schedule for two years, the Virgin Valley High School staff in Mesquite, Nevada, decided to attempt hand generation of the schedule to be used for the 1965-1966 school year. Under the leadership of Principal Blaine W. Allan, this project was planned and developed. It was decided that certain decisions had to be made before the actual scheduling could get underway. Some of these decisions are the following:

1. How long will a module be? (12 min., 15 min., 30 min., etc.)
2. How many modules will be scheduled each day?
3. Which courses will be offered during this school year?
4. How long will the scheduling cycle be? (daily, weekly, bi-weekly, etc.)
5. What will the priorities of given classes be?
6. Will the course be a semester course or a year long course?

After the above decisions were made, the staff was assembled to generate the schedule. At Virgin Valley, a 30-minute module was selected with 16 modules per day. The schedule was to run on a one week cycle. The teachers and administration made decisions on course offerings for the year and the time length of the courses. The priorities for classes were selected as follows:

Reasons for their specific placement on the priority scale are also given.

Modular Schedules - Hand Generated (Cont.)

| <u>Priority</u> | <u>Subject Area</u> | <u>Reason(s) for this priority selection</u> |
|-----------------|---------------------|--|
| 1st | Music | 1. Cuts accross all grade levels, 7-12. 2. Large number of students involved. |
| 2nd | English | 1. Required Course - 4 years English. |
| 3rd | Math | 1. Longer blocks of time required. 2. Required Course - 2 years Math. |
| 4th | Science | 1. Important in student's future life. 2. Required Course - 2 years Science. |
| 5th | Soc. Science | 1. Required Course - 3 years Soc. Science. |
| 6th | Physical Education | 1. Required Course - 4 years. |
| 7th | Electives | 1. Recommend 2 credits - Fine Arts 2. Recommend 2 credits - Practical Arts |

The Fine Arts program was last on the list of electives because of a completely individualized program. No specific time schedule is needed with this type of program.

To begin scheduling, the teachers will need an information sheet including the following:

1. List of priorities in order.
2. Courses to be offered during the year.
3. Teacher assignments for specific courses.
4. List of modules throughout the week to be scheduled for special meetings or events. These modules will be put on the schedule before normal classes are scheduled.

After such things as student assemblies, faculty meetings, and other essentials are scheduled, the remainder of the schedule can be completed.

One must first make up one graph board for each day on the cycle. Virgin Valley's schedule was recycled every five days so five daily boards are made up. The teachers will appear across the top of the board, the modules or periods will appear on the left-hand side of the graph. Moveable blackboards work very nicely to make up these graphs. A graph ready to complete would appear similar to that given on the next page.

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | |

The boards should be made up before the scheduling session. Paper to fit the blocks on the graph should be cut from several colors of paper. A different color will be needed for each teacher. The number of sheets each teacher will need will vary according to the number of classes he will teach and the number of modules he will teach in each class. Each sheet represents one module of time. On a schedule similar to that of Virgin Valley's, one would use 35-50 sheets of each color. After the teachers receive the small slips of paper, they would write the course names, numbers and grades of students involved in the course on the sheets with a magic marker, or other suitable process so it can be seen and read from a distance of about 20 feet. The number of sheets you will need for each class will depend on the number of modules that class meets each week. When each teacher has completed filling out his course sheets, scheduling can begin. Teachers then go to the large graph boards according to priorities and place their course cards under his name each day and at the various modules he desires to hold his classes during the various days of the week. The teacher should make sure the classes he is scheduling are not in conflict with classes already on the board. It speeds up the process if each teacher will put tape on the back of the course cards so they can simply stick the card on the graph.

After scheduling has been completed, conflicts will be worked out between the teachers involved. These conflicts are usually very easy to resolve if the staff is willing to give and take and reshuffle their program a little. When the staff is larger than 25 teachers, we recommend using the computer.

If your school district has in-service training days, this would make a very good project for teacher training. This type of scheduling involves the entire staff and gives them some insight as to the problems the administration faces when making up a schedule. It also gives them the opportunity to iron out difficulties before the schedule is put into practice.

After all conflicts have been eliminated as much as possible, a check should be made for each class to insure there are no conflicts which have been overlooked. When this has been determined, a copy of the master schedule for each day of the cycle should be made. Individual teacher schedules may be made up by filling in information from the daily boards into a form such as the one shown below.

Mr. Clarke

Name

| Mod | Monday | Tuesday | Wednesday | Thursday | Friday |
|-----|-----------|-----------|-----------|-----------------|-----------|
| 1 | | | | | |
| 2 | Assembly | | | | |
| 3 | Art 10-12 | | Art 9 | Art 11-12 | |
| 4 | Art 8 | Art 10-12 | | Art 9 | |
| 5 | Art 11-12 | | Art 10-12 | | |
| 6 | Art 9 | Art 11-12 | Art 8 | Art 10-12 | |
| 7 | | Art 9 | Art 11-12 | | |
| 8 | Lunch | Lunch | Lunch | Lunch | Lunch |
| 9 | Art 9-10 | Art 11-12 | Art 11-12 | Art 9-10 | Art 9-10 |
| 10 | Art 9-10 | Art 9-10 | Art 11-12 | Art 11-12 | Art 9-10 |
| 11 | Art 11-12 | Art 9-10 | Art 9-10 | Art 11-12 | Art 11-12 |
| 12 | Art 11-12 | Art 11-12 | Art 9-10 | Art 9-10 | Art 11-12 |
| 13 | | | | Faculty Meeting | |
| 14 | | | | Faculty Meeting | |
| 15 | | | | | |
| 16 | | | | | |

The completed schedule will appear as follows:

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|----------------------|----------------|---------------|--------------|----------------|---------------|---------------|--------------|-------------|--------------|--------------|---------------------|-------------|--------------|
| 1 8:00- 8:30 | Band 5-6 | Rd. Sp. | Prep | Prep | Prep | Eng 7 | Math 9-10 | Prep | Coun | Am. Hist | Math 9-10 | Am. Govt | Prep |
| 2 8:30- 9:00 | Prep | Rd. Sp. | Prep | Prep | Prep | Eng 7 | Math 9-10 | Prep | Coun | Am. Hist | Math 9-10 | Am. Govt | Prep |
| 3 9:00- 9:45 | Prep | Prep | Lab | Prep | Art 10-12 | Geom 11-12 | Study | Hist 8 | Coun | GPE 11-12 | Farm Mech | Math 7 | Eng I |
| 4 9:45- 10:30 | Prep | Prep | H.E. 7-8 | Ind Arts | Art 7-8 | Eng 11-12 | Prep | Wd. Hist | Empl Prep | Prep | Prep | Study | Eng III |
| 5 10:30- 11:15 | Band 7-12 | Lab | Lab | Dr. Ed. | Art 11-12 | Earth Sci | Prep | Study | Coun | Prep | Rural Id Shop | Prep | Phys- ics |
| 6 11:15- 12:00 | Lab | Off. Prac | H.E. | Lab | Art 9 | Prep | Alg. II | Hist 7 | Sthd I | GPE 9-10 | Alg. I | Math 8 | Study |
| 7 12:00- 12:30 | Study | Basic Bus. | P.E. 7-8 | Draft | Lab | Prep | Bio. | Prep | Coun | GPE 7-8 | Hort | Hlth 7-8 | Eng II |
| 8 12:30- 1:00 | LUNCH | | | | | LUNCH | | | | | LUNCH | | |
| 9 1:00- 1:30 | Span. | Off. Prac | Fd. Cl. | Study | Art 9-10 | Voc. Eng | Sci. 8 | Hlth 10 | Sht Hand | P.E. | Eng- ines | Prep | Elec |
| 10 1:30- 2:00 | Mus. 7-8 | Type I | Fd. Cl. | Study | Art 9-10 | Voc. Eng. | Lab | Prep | Coun | P.E. | Eng- ines | Prep | Elec |
| 11 2:00- 2:30 | Chorus 9-12 | Rd. Sp. | Fam. Liv. | Lab | Art 11-12 | Eng. 8 | Lab | Study | Coun | Ath. | Eng- ines | Ath. | Lab |
| 12 2:30- 3:00 | Chrous 9-12 | Type I | Fam. Liv. | Lab | Art 11-12 | | Sci. 7 | Study | Coun | Ath. | Eng- ines | Ath. | Lab |
| 13 3:00- 3:30 | | Drill Team | | Dr Ed 10-12 | Year- book | | | | Jour. | | Lab | | |
| 14 3:30- 4:00 | | Drill Team | | Dr Ed 10-12 | Year- book | | | | Jour. | | Lab | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

This type of scheduling has helped our staff and program tremendously.

MODULAR SCHEDULING
BIBLIOGRAPHY

Books and Monographs

- Allan, Blaine W., "Individualized Learning through Computerized Modular Scheduling" and "Modular Scheduling and the Computerized Schedule" first and second report of the scheduling project at Virgin Valley High School, Mesquite, Nevada, printed by the Nevada Department of Education in co-operation with David L. Jesser, Nevada Director of Western States Small Schools Project, 1963.
- American Educational Research Association, "Educational Organization, Administration and Finance," David R. Krathwohl, Ed., Review of Educational Research, Volume 31, Number 4 (Washington, D. C., 1961), pp. 351-438.
- Anderson, Robert, "Organizing Groups for Instruction," Nelson B. Henry ed.; Individualizing Instruction, the Sixty-First Yearbook of the National Society for the Study of Education (Chicago, 1962), pp. 239-264.
- Beggs, David W. et al., Team Teaching - Bold New Venture, Unified College Press (Indianapolis, Indiana, 1964), pp. 1-208.
- Beggs, David W. and Edward G. Buffie, Independent Study - Bold New Venture, Indiana University Press, Bloomington, Indiana, 1965, 1-217.
- Bush, Robert N. and Dwight W. Allen, A New Design for High School Education: Assuming a Flexible Schedule, Secondary Education Project, Stanford University (Stanford, 1961), pp. 1-122.
- Elam, Stanley (ed), Research Studies in Education, 1960, Phi Delta Kappa (Bloomington, Illinois, 1960), pp. 1-86.
- Estes, W. K., "Learning," C. W. Harris and M. R. Liba, Eds., Encyclopedia of Educational Research, Macmillan and Company (New York, 1960), pp. 752-767.
- Goodlad, John D., "The Increasing Concern for Effective Teacher Utilization," F. S. Chase and H. A. Anderson, eds., The High School in a New Era, University of Chicago Press (Chicago, 1958), pp. 1-350.
- Heller, Melvin P. and Elizabeth Belford, Team Teaching and Staff Utilization in Ridgewood High School, Ridgewood Board of Education (Norridge, Illinois, 1960), pp. 1018.
- Hilgard, Ernest R., "Learning Theory and its Application," New Teaching Aids for the American Classroom, Institute for Communications Research (Stanford, 1960), pp. 19-27.

Kingsley, Howard L. and Ralph Garry, *The Nature and Conditions of Learning*, Prentice-Hall, Inc. (Englewood Cliffs, N. J., 1957) pp. 1-521.

Lear, John, "A New Look at the Human Mind," *Saturday Review* (April, 1961), pp. 39-41.

WSSSP, "Scheduling for Flexibility in Small Schools." (April, 1966)
EDITED BY David L. Jesser and Rowan C. Stutz.

Lobb, Delbert, *An Experimental Study of Means of Improving the Utilization of the Staff in the Secondary Schools, Report of Jefferson County, Colorado, School System* (Colorado, 1959), pp. 1-55.

Lobb, Delbert, *A Report of a Three Year Study, Jefferson County, Colorado, School System* (Colorado, 1960), pp. 1-30.

Manlove, Donald C. and David W. Beggs, III, *Flexible Scheduling - Bold New Venture*, Indiana University Press, (Bloomington, Indiana, 1965) pp. 1-157.

Morse, Arthur D., "Team Teaching in Action: The Franklin School in Lexington, Massachusetts," *Schools of Tomorrow - Today*, Doubleday and Co., (New York, 1960), pp. 9-26.

Research Division of the National Education Association, "Abstracts of Reported Studies of Reorganization of the Professional Staff," in *Studies of Utilization of Staff, Building, and Audio Visual Aids in the Public Schools*, National Education Association (Washington, D. C., 1959), pp. 1-24.

Trump, J. Lloyd, *Images of the Future: A New Approach to the Secondary Schools*, National Association of Secondary School Principals (Washington, D. C., 1959), pp. 1-46.

Trump, J. Lloyd, *New Directions to Quality Education*, National Association of Secondary School Principals (Washington, D. C., 1960), pp. 1-14.

Trump, J. Lloyd, and Dorsey Bayham, *Focus on Change*, Rand-McNalley (Chicago 1961), pp. 1-147.

United States Office of Education, *Cooperative Research Project, Bulletin 1961. Number 18*, United States Government Printing Office (Washington D. C., 1961), pp. 1-40.

Vinacke, W. Edgar, *The Psychology of Thinking*, McGraw-Hill (New York, 1957), pp. 1-361.

Wall, Harvey R. and Robert W. Reasoner, *Team Teaching: A Descriptive and Evaluative Study of a Program for the Primary Grades, Mt. Diablo School District* (Concord, California, 1962), pp. 1-131.

Wrightstone, J. Waye, "Class Organization for Instruction," What Research Says to the Teacher, Department of Classroom Teachers and the American Educational Research Association of the National Education Association (Washington, D. C., 1957), pp. 1-142.

Periodicals

California Journal of Secondary Education, "Needed Next Steps in Flexible Scheduling", Vol. 35, (November, 1960), pp. 405-407.

National Association of Secondary School Principals Bulletin, "New Horizons in Staff Utilization," Vol. 42 (January, 1958), pp. 1-213.

National Association of Secondary School Principals Bulletin, "Exploring Improved Teaching Patterns," Vol. 43 (January, 1959), pp. 1-348.

National Association of Secondary School Principals Bulletin, "Progressing Toward Better Schools," Vol. 44 (January 1960), pp. 1-380.

National Association of Secondary School Principals Bulletin, "Seeking Improved Learning Opportunities," Vol. 45 (January, 1961), pp. 1-352.

National Association of Secondary School Principals Bulletin, "Locus of Change," Vol. 46 (January, 1962), pp. 1-360.

National Association of Secondary Schools Principals Bulletin, Vol. 47, May, 1963.

Anderson, G. Ernest, How EDP Schedules Classes, Nation's School, Vol. 75, No. 4 (April, 1965), pp. 80-82.

Allen, Dwight W., Elements of Scheduling a Flexible Curriculum.

Anderson, Robert H., "Team Teaching in Action," Nation's Schools, Vol. 65, (May, 1960), pp. 62-65.

Anrig, Gregory R., "Promising and Perplexing Aspects of Large Group Teaching Experiments," The Bulletin of the National Association of Secondary School Principals, Vol. 46 (January, 1962), pp. 250-260.

Beggs, David W., "A Success Story of Small and Large Group Instruction: The Decatur-Lakeview Plan," Overview, Vol. 3, No. 12 (December, 1962), pp. 42-48.

Besvinick, Sidney L., "Scheduling Problems: How Many? How Long? The Clearing House (March, 1965), pp. 425-427.

Buehring, Leo E., "Nonteaching Duties Reduce Effectiveness of Instruction in Secondary Schools," The Nation's Schools, Vol. 60, No. 5, (November, 1957), pp. 76-77.

Buehring, Leo E., "Nonteaching Duties Reduce Effectiveness of Instruction in Secondary Schools," The Education Digest, (February, 1958), pp. 17-19.

- Bush, Robert N., "Team Teaching Bandwagon," (editorial), California Journal of Secondary Education, Vol. 3, No. 12, (December, 1962), pp. 42-48.
- Cassel, Joe W., "Rescheduling to Improve the Instructional Program," School Board Journal, (October, 1963), p. 15.
- Congreve, Willard J., "Toward Independent Learning" The North Central Association Quarterly, Vol. 39 (Fall, 1964), pp. 298-302.
- Cunningham, Lavern, "Team Teaching: Where Do We Stand?" Administrators Notebook, Vol. 8 (March, 1960), pp. 1-4.
- Drummond, H. D., "Team Teaching: An Assessment," Educational Leadership Vol. 19 (December, 1961), pp. 160-165.
- Gale, R. F., "Comparative Study of College Experiments of Graduates of the Core and of the Conventional Curricula," Journal of Experimental Education, Vol. 27, (January, 1959), pp. 283-296.
- Goodlad, John L., "Experiment in Team Teaching," Elementary School Journal, Vol. 59, (October, 1958), pp. 11-13.
- Hooker, C. P., and C. M. Lindvall, "The Student's Day Hasn't Changed Much - - Or Enough Either," The Nation's Schools, Vol. 59, No. 6 (June, 1957), pp. 48-49.
- Hough, John B., "Research Vindicating for Teaching Machines," Phi Delta Kappan, Vol. 43, (March, 1962), pp. 240-243.
- Howard, Eugene R., "Modular Scheduling in the Senior High School - - A Means of Improving Instruction," The High School Journal, (January, 1965), pp. 282-288.
- Jesser, David L., "Schedules - - A Reappraisal," Nevada Education Bulletin, (January, 1964), pp. 29-33.
- Kenny, James Benson, "A Comparison of Two Methods of Class Scheduling," Dissertation Abstracts, University of Microfilms, Inc., Ann Arbor, Michigan, Vol. XXV, No. 10.
- Jarvis, Oscar T., "Time Allotment Relationships to Pupil Achievement," Elementary English.
- Lear, John, "A New Look at the Human Mind," Saturday Review, (April, 1961), pp. 39-41.
- Murphy, Judith, "School Scheduling by Computer," The Education Digest, (April, 1965), pp. 5-8.
- Ohm, Robert E., "Toward A Rationale for Team Teaching," Administrators Notebook, Vol. 9 (March, 1961), pp. 1-4.
- Olds, Henry, "Survey of a Meeting on Team Teaching," Minutes, (Committee on Team Teaching), Chicago (March, 1961), pp. 1-8.

- Pitruzzello, Philip R., "Report on Team Teaching," Clearing House, Vol. 36, (February, 1962), pp. 333-336.
- Ploughft, M. E., "Another Look at Team Teaching," Clearing House, Vol. 36 (December, 1961), pp. 219-221.
- Robb, M. H., "Flexibility? Try a Module," The Clearing House, (May, 1962) p. 550.
- School Management, "A Trump Plan," School - - Four Years Later, The Education Digest, (January, 1965), pp. 13-16.
- Siegel, L., and others, "Effectiveness of Large Group Instruction at the University Level," Harvard Educational Review, Vol. 29 (Summer, 1959), pp. 216-226.
- Symposium: "Using Team Teaching to Individualize Instruction," Journal of Secondary Education, Vol. 36 (November, 1961), pp. 414-446.
- Szabo, L. J., "Team Teaching: Honor Students Undergo Experiments," New York State Education, Vol. 49 (September, 1961), pp. 12-13.
- Taylor, Harris A., "Claremont Graduate School Program for Team Teaching," High School Journal, Vol. 43 (February, 1960), pp. 277-282.
- Trump, J. Lloyd, "New Directions in Scheduling and Use of Staff in the High School," California Journal of Secondary Education, Vol. 33, No. 6 (October, 1958), pp. 362-372.
- Trump, J. Lloyd, "Flexible Scheduling - Fad or Fundamental?," Phi Delta Kappan, (May, 1963), pp. 367-371.
- Trump, J. Lloyd, "Quality Education of the Future," Frontiers of Education, Report of the Twenty-Seventh Educational Conference, Educational Records Bureau (November, 1962), pp. 23-39.
- Trump, J. Lloyd, "The Experiments We Need," The North Central Association Quarterly.
- Whitcomb, Mildred, "Catskill Area Says: Yes, Small High Schools are Worth Retaining," The Nation's Schools, Vol. 63, No. 4 (April, 1959), pp. 63-66.