Social Distancing in the Classroom

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The Challenge 2020
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Survey (55 students)

- In-person: 45%
- Both: 43%
- Online: 12%
Problem Statement:

How can physical interaction be reduced in classrooms?
Location: Classroom

Desks in a standard classroom [3]

Classroom collaboration [4]
Our Solution

2 parts:
- modified schedule
- desk arrangement
4000 students
160 classrooms
6 classes

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<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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</thead>
<tbody>
<tr>
<td>Group A:</td>
<td>1st 2nd 3rd</td>
<td>online learning</td>
<td>4th 5th 6th</td>
<td>online learning</td>
<td>online learning</td>
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<td>A-M</td>
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<td>Group B:</td>
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<td>1st 2nd 3rd</td>
<td>online learning</td>
<td>4th 5th 6th</td>
<td>online learning</td>
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<td>N-Z</td>
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each class period is 2 hours
def getDesks(shapesInARow, numRows, numOfSides):  # only works for horizontal line of shapes
    desksInARow = numOfSides
    for i in range(shapesInARow - 1):  # calculates number of desks in the first row
        if numOfSides % 2 == 1:
            desksInARow = desksInARow + (numOfSides - 1)
        elif numOfSides % 2 == 0:
            desksInARow = desksInARow + (numOfSides - 2)
    # print(desksInARow)
    desks = desksInARow
    if numOfSides is 3:
        for i in range(numOfRows - 1):
            if i % 2 == 0:
                desks = desks + int(desksInARow/2)
            else:
                desks = desks + int(desksInARow/2) + 1
        return desks
    if numOfSides is 4:
        for i in range(numOfRows - 1):
            desks = desks + int(desksInARow/2)
        return desks
Desk Formations: Triangles

![Equilateral triangle diagram](triangle.png)

- **Classroom size:**
  - 30 ft x 30 ft

- **5.19 ft x y ≈ 20.8 ft**

- **22 desks total**

- **6 ft x y = 24 ft**

- **Equilateral triangle calculation:**
  \[ 6^2 - 3^2 = \sqrt{27} \approx 5.196 \]
Desk Formations: Hexagons

Regular Hexagon

Classroom size:

\[ 30 \text{ ft} \times 30 \text{ ft} = 900 \text{ ft}^2 \]

Row 1:

\[ 5.196 \text{ ft} \times 4 = 20.8 \text{ ft} \]

Row 2:

No desks

16 desks total
Desk Formations: Squares

Classroom size: 30 ft x 80 ft

0 desks

6 ft x 4 = 24 ft

25 desks total
Design Implementation

- Counselors
- Teachers
- Education Board
Barriers to Design Implementation (Schedule)

1. Teacher workload
2. Access to technology
3. Parent opinion
4. Student opinion

Computers [6]
Barriers to Design Implementation (Layout)

5. Space
6. Group work
How Will Our Solution Change the Classroom?

- The main dynamic stays the same
- Group work

Students using technology [8]
Working as a Team

- Successes: communication and compromise
- Failures: Engineering Notebook
- Lessons
References

7. Schools and Staffing Survey (SASS). 2012, nces.ed.gov/surveys/sass/tables/sass1112_2013314_t1s_007.asp.