GRAPHING THE FRIENDSHIP GAME

A Preliminary System Dynamics Lesson

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INTRODUCTION

A good lesson takes on a life of its own. It also inspires the development of other lessons. In this paper, the previously published "Friendship Game" by Peg Clemans becomes the foundation for an introductory graphing lesson for students in grades K, 1 and 2.

In the Friendship Game, primary students combine a preliminary system dynamics graphing lesson with the social competency curriculum to gain a deeper understanding of how their own behavior affects the atmosphere of the entire class. Primary students frequently discuss appropriate and inappropriate classroom behaviors. They also know from experience that if someone "starts something," meanness can escalate to make the class an unfriendly place for everyone. However, although young students can easily recognize this, they may not understand their own role in the situation. The Friendship Game shows them that inappropriate behavior can spread, but friendly behavior can also spread if students choose to use the friendship behaviors they have learned rather than inappropriate behaviors. The game is simplistic, but it gives students another way to view and resolve bigger social issues in the classroom. In the process, they also build graphing skills.

THE ORIGINAL FRIENDSHIP GAME

The "Friendship Game" was written by Peg Clemans in 1996 at the Catalina Foothills School District in Tucson, Arizona. The complete game is available free on-line from the Creative Learning Exchange at http://www.clexchange.org under the list of social studies materials.

To briefly summarize the game, students first discuss behaviors that make and keep friends, called *friendship skills*, and behaviors that block friendships, called friendship *blockers*.

- At the beginning of the game, a few students are designated as people using *friendship skills* and people using friendship-*blocking* behaviors, while the remaining students are grouped together as players who are in neither category.
- For each round of the game, each friendship skills person and each blocker behavior person taps one of the remaining students and takes that person back to the place in the room designated for friendship skills people or blockers.
- As a class, students observe how the numbers of "friends" and "blockers" grow.
- Students play the game with varying numbers of initial friends and blockers and make predictions on the outcomes.
- Note that the focus is on friendship building and blocking *behaviors* and what happens when students choose to use either. A student is not labeled a "friend" or "blocker" himself. The game provides an impersonal way for a class to discuss how an individual's behavior choices can affect the whole class.

In playing, students "experience the concept that practicing their friendship skills could not only lead to a friendship, but could also make more friendships likely." This introduces them to the concept of reinforcing relationships: The more they use their friendship skills, the more friends they make, which leads to more friendships. The same thing applies to using friendship blocker behaviors, causing fewer friendships. The original game concludes with a causal loop diagram of this reinforcing relationship.

VARIATIONS

Alan Ticotsky, a Waters Foundation systems mentor in Carlisle, Massachusetts, has been using the Friendship Game with primary students for three years. It ties in well with Carlisle's social competency curriculum and children love to play it. Over time, he has adapted the game for students in kindergarten, first and second grades. He has also used the game to teach these students graphing.

Game Logistics

To smooth the play of the game, issue each student a colored card rather than using the optional colored cloth strip belts suggested in the original game. The colored cards help young children remember their roles in the game. Cards also help them later read the graph of the game because the same colors will be used for lines on the graph representing each group. **B**lue cards are for **B**lockers, **p**ink cards are for the pool of **P**layers, and green cards are for the friends. (Explain that there is no color beginning with "F" for friends-- students can remember that green is for friends by noticing that the two "*e*"s sitting together in the middle of "gr*ee*n" are friends.) When players are chosen by friends or blockers to join the other friends and blockers in their corners of the room, they exchange their pink cards for blue or green ones. This makes it easier to count the three groups for graphing: Students hold up their cards and count them as a class.

Feedback

The original game has three parts. In Objective 1, students discuss friendship skills and friendship blockers and make a wall mural illustrating these behaviors. In Objective 2, students play games of one round each, starting with 6 friends and 3 blockers (or 3 friends and 6 blockers) so that most of the class is selected in one round. They predict and evaluate outcomes.

Objective 3 in the original game introduces feedback as each new friend or blocker also recruits a new member over several rounds of the game. The class analyzes the accumulations. Alan has focused most of his lesson on this final objective of the game because it lends itself very well to the introduction of graphing behavior over time.

GRAPHING THE FRIENDSHIP GAME

Objectives for the Graphing Lesson

- Students will record the progress of the Friendship Game as a class by counting and graphing the numbers of students in each category over several rounds.
- They will learn how to mark points on the graph and connect the points with lines.
- They will observe that the line goes up when the number of students in a category is growing and the line goes down when the number of students in a category is decreasing.

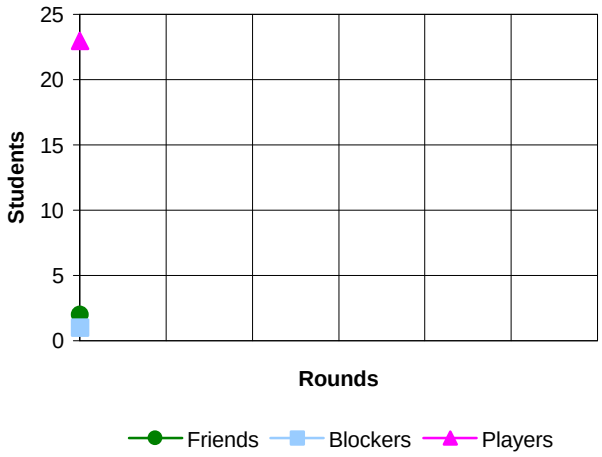
Materials

- A large easel graph pad; pink, green and blue markers
- Pink, green and blue cards (or pieces of paper), about 25 of each color.

Playing the Game with Graphing

1. After discussing friendship and blocking behaviors, explain to students that they will be playing a game to see what happens when people use their friendship skills. Introduce the rules of the game:
    - Two people will be *friends*. They will have green cards. (Again, students can remember that green is for friends by noticing the two friendly "*e*"s sitting together in the middle of the word.)
    - One person will use *blocker* behaviors (just for the game) with a blue card. (Memory device: "blue" and "blocker" start with the same sound.)
    - The rest of the students will be *players*, with pink cards. (Both begin with "p.")
    - When the game starts, the players will be sitting with their eyes closed. The friends and blockers will each tap one player to join them in the groups of friends or blockers in their corners of the room. The tapped players will exchange their pink cards for blue or green cards because now they have become friends and blockers.
    - As a class, students will count the number of students in each group at the end of each round.
    - They will play several rounds until everyone gets to play.
    - The graph will be their "scorecard." It will help them keep track of the game. (This sports analogy heightens their interest in the game and the graphing.)

2. Draw a large graph on an easel graph pad. The horizontal axis is time; it marks the rounds of the game. Label the number of rounds across the bottom. The vertical axis counts the number of friends, blockers and players; label it from 0 to the number of students in the class.



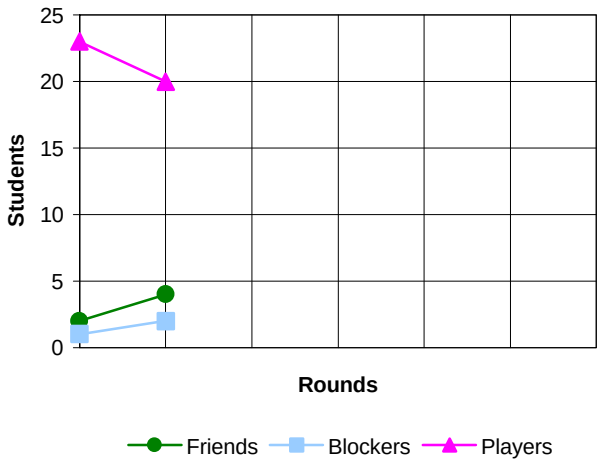
Note: On your graph, label *every* number on vertical axis, counting together as a class. Label the horizontal axis starting with 0 for the initial conditions at the start of the game.

3. Record the initial numbers of friends, blockers, and players on the vertical axis. For very young students, it seems to be enough to tell them to "climb up the ladder, counting the steps to the right spot." Mark the spots with dots using green, blue and pink markers.

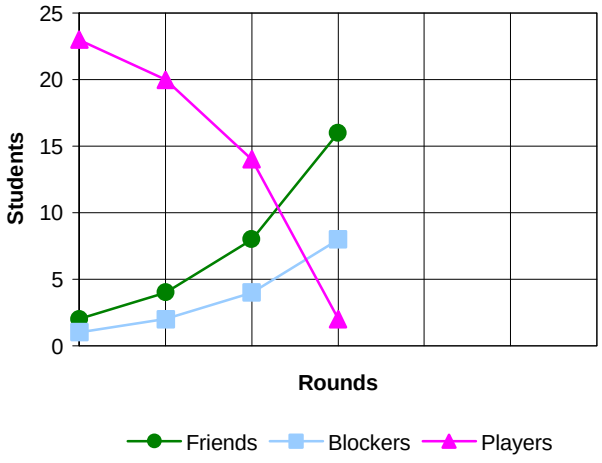
4. You will be making a *line graph* of the game. Making and reading line graphs is a very important system dynamics skill because line graphs show patterns of change. If your students are familiar with only bar graphs, explain to them that this time you will be putting a

dot only on the "top" or "roof" of the stack. (Unifix cubes held up to the graph help explain this.) Instead of coloring in bars, students readily grasp the idea of "climbing up the ladder, counting the steps to the right number," "marking the spot" and "connecting the dots."

5. After one round of the game, stop to count the groups and fill in the graph. Now the number of friends and blockers has risen while the number of players has declined. Together, "count up the ladder," "mark the new spots," and "connect the dots." Do this for two more rounds.



6. Each round, discuss what is happening to the groups of students and to the lines on the graphs. Help students relate their concrete game to the more abstract lines on the graph.
    - What is happening to the number of friends in their corner of the room? What is happening to the line on the graph representing friends? Why is the line going up?
    - What about the blockers? What is happening to their numbers and the line on the graph? It is going up too, but why is it not as high and steep as the friends' line?
    - What is happening to the line for players? Why is it going down?
    - Can they predict what will happen in the next round? (For older students, what would happen if blockers tapped two players and friends tapped only one player each turn instead of the other way around? What about other values?)



7. By the end of the third round, you will be running out of players in the remaining pool. You can point that out and end the concrete game there. (For older students, you can extend the game by combining classes to play with more students, by using colored cards to represent more players, or by experimenting with different values for the numbers of players tapped by friends and blockers.)

8. In conclusion, relate the findings on the graph back to the original discussion about friendship skills and classroom behavior.
    - What would a class be like with 16 friends and 8 blockers? How did the number of blockers grow? Discuss how negative behaviors can foster more negative behaviors, making the class an unfriendly place for everyone.
    - If more people used friendship skills, would there be more friends? What would that class be like? How does friendly behavior foster friendly behavior in return?
    - What is their responsibility in all of this? How does their own behavior make a difference if they choose to use their friendship skills or choose to block friendships?
    - What can they each do to make their classroom a friendly place?

ADAPTATIONS FOR DIFFERENT GRADE LEVELS

In Carlisle, all students play the Friendship Game in grades K, 1 and 2, laying the groundwork for more advanced system dynamics lessons in later grades.

Kindergarten

With young children, it takes longer to explain the rules of the game and play it, so there is time for only two rounds at first. Emphasis is on learning the rules, practicing counting as a class, and introducing the idea of graphing as a way to keep track of the numbers of students. Students learn that the lines on the graph go up or down as the numbers of students go up or down.

First Grade

Because students already know the mechanics of the game, they can focus more on the concepts of the lesson. They can discuss how their behaviors can make and prevent friendships, and they can understand the concept that making friends leads to making more friends. They also have more advanced math skills. Throughout the game, they can practice counting, adding, subtracting and estimating. They are able to analyze the graph and use it to make predictions. Finally, first graders have the time and attention span to play three rounds of the game, substituting colored cards for extra players when they run out.

Second Grade

By second grade, students are able to plan strategies. After playing three rounds with two initial friends and one initial blocker, they can try other combinations (like one friend and two blockers) and interpret the different graphs. Playing the game with two combined classes allows for more rounds of the game and many variations in starting values. These students can begin to talk about “rates of growth” and “behavior over time” at a very basic level.

THE IN AND OUT GAME

Another preliminary system dynamics lesson for young students is the "In and Out Game" by Alan Ticotsky and Rob Quaden with Debra Lyneis (available on-line from the Creative Learning Exchange at http://www.clexchange.org). This lesson uses a concrete classroom activity to introduce students to stock and flow diagrams. Students physically move into and out of the stock following varying rules. They use a table and a graph to record and analyze what happens. Carlisle students usually play the Friendship Game first and lead into the In and Out Game.

Both The Friendship Game and the In and Out Game model discreet activities; students are counting individual classmates as they move from one group to another. These concrete activities prepare students to understand continuous flows later. The Friendship game includes feedback because the number of new friends depends on the previous number of friends, while the In and Out Game does not include feedback at first because the flows are constant. Both lessons teach graphing. For very young children, system dynamics skills need to be broken into small pieces that are presented and reinforced through many different lessons like these.

YOUR FEEDBACK

We welcome your feedback on this lesson. Please send your comments and suggestions for improvement to us through the Creative Learning Exchange at LyneisD@clexchange.org. Thanks.