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Gamifying graphing: Using a party game to teach graph construction and interpretation

Hans D. Lemke

University of Maryland, College of Computer, Mathematical, and Natural Sciences, H. J. Patterson Hall, College Park MD 21075, U.S.A.
(**hlemke@umd.edu**)

Research shows that graph reading is not intuitive, and that many instructors are blind to the lack of comprehension students have when graphs are used in class. Although we think of graphs as an easy way to get information, we often forget that this is a skill that we have built through years of practice. We developed an exercise using the party game *Charty Party* to give students a fun place to start practicing graph design and interpretation. This game is similar in design to the popular family game *Apples to Apples* but uses graphs as its foundation.

Keywords: Graphing, data visualization, games, data literacy

Introduction

The development and interpretation of graphs are listed as core competencies in *Vision and Change in Undergraduate Biology Education* (AAAS 2010) and many other inventories of the skills necessary for scientific literacy (e. g., Gormally et al. 2012). Students struggle with these skills and targeted interventions are necessary for them to gain the knowledge and experience they need to be successful (Angra and Gardner 2016, Feser et al. 2013, Speth et al. 2010).

We have developed a series of laboratory activities to give students experience interpreting and constructing graphs. The exercise presented here is one part of this. We begin with online pre-lab exercises that include a description of different types of graphs and the Mathbench module *A Graphing Primer* (Thompson et al. 2010). During the lab period that week, the students complete the exercise below, interpret and critique a set of graphs and create a graph of their data from an earlier experiment. In later weeks, they learn how to pick which graph type to use and how to create graphs using R (R Core Team 2020).

Student Outline

INTERPRETING GRAPHS: PART 1

Before we get too far into complicated graph interpretation, let's have some fun and look at some simple graphs.
Get a set of *Charty Party* cards for your group.
General rules

- It's like *Apples to Apples* or *Cards Against Humanity*.
- Deal 7 orange cards per player.
- Pick someone to be the judge.
- The judge reveals one white card.

- Each other player secretly plays an orange card from their hand that they think is the best choice for the y-axis.
- The judge reads them all and decides which combination is the winner.
- Draw a new orange card and let the next player be the judge.

Activity

1. Play a game of *Charty Party*.
2. Have everyone judge at least once.
3. Set aside the graph card and winning y-axis card from each judge's round.
4. As a group, pick one of the winning combinations.
5. Draw the graph here:
6. Add units and a scale to the y-axis.
7. Write a hypothesis for an experiment that would produce these results.
8. Write a results statement for the experiment.
9. Write a caption.
10. Present your graph to the class using the document camera on the front bench.

Figure 1. A typical graph card and choices for the y-axis.

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Materials

- There are enough cards in one game that you can easily divide it between two or more groups.
- There are two versions of *Charty Party*: the regular edition (orange box) and the *All Ages* edition (purple box). For classroom use, the *All Ages* edition is the one to use. The regular edition contains a lot of content that some people are sure to find objectionable.
- A big thanks to the crew at Very Special Games (www.veryspecialgames.com) for providing copies of *Charty Party* for this workshop.

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About the Authors

Hans is the Lab Coordinator for the Principles of Ecology and Evolution Lab (BSCI161) at the University of Maryland. He holds a B.A. in Biology from St. Mary's College of Maryland, an M.S. in Entomology from the University of Maryland, and an M.D.E. in Distance Education from University of Maryland, University College. His current research focuses on educational outcomes in laboratory and online settings and a survey of tiny Miocene shark and ray fossils found along the Chesapeake Bay.

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