Bears in the Air

OVERVIEW

Through a game in which an object is tossed as fast as possible around a circle, students experience the limits of success, redesign their "tossing system" to meet their goal, and begin to identify assumptions that drive behavior.

INQUIRY/CRITICAL THINKING QUESTIONS

- How do mental models and assumptions keep us from reaching our goals?
- How can we redesign a system that is not functioning well to achieve our desired outcome?

OBJECTIVES

Students will:

- Experience how mental models can limit our success and keep us from reaching our goals
- Redesign a system to accomplish a shared goal
- Discuss how this activity models real-world systems and explore possible redesigns of those systems

TIME REQUIRED: 30 min - 1 hr

KEY ISSUES/CONCEPTS

- **System dynamics and redesign**
- **Mental models**
- **Limits to success**

SUBJECT AREAS

- **Social Studies** (Geography, Civics/ Government, Economics, Global Studies, Contemporary World Problems)
- **Science** (Life, Environmental, Physical)
- **Business/Finance**

NATIONAL STANDARDS CONSISTENCY

- **NCSS: 5, 10**
- **NSES: F, G**

GRADE LEVEL: 5–12

FTF Related Reading

- Intermediate: Chapter 9 from *Global Issues and Sustainable Solutions*
- Advanced: Unit 1 Chapter 3 and Unit 7 from *It's All Connected*

Materials/Preparation

- A stuffed bear or other easy and safe-to-throw-and-catch object
- Watch with a second hand to time activity
- Clear an area in the classroom large enough for students to stand in a circle

Activity

Introduction

1. Arrange students so they are standing shoulder- to-shoulder in a circle. Stand in the circle with them and show them the stuffed bear or other object.
2. Tell students they are going to play a game in which they toss the bear around the circle. Tell them there are

Bears in the Air

only 2 rules to the game: (1) Everyone must touch the bear and (2) They must touch it in the same sequence each time.

3. Have everyone hold their hands out in front so they are ready to catch the bear.
4. Gently toss the bear to someone across the circle.
5. Have that person toss the bear to someone else and drop his or her hands after tossing. The last person tosses the bear back to you.
6. Practice once so they are comfortable with the sequence.
7. Now tell them you are going to time the activity to see how fast they can do it. You will need to either time it yourself or designate a student for that job ahead of time.
8. Run the activity and time it. After the first timed run-through, tell students that you are sure they can do it much faster. Run and time the activity a few more times, telling them after each run-through that they can do it even faster. Most likely they will be able to do it faster in the beginning just by tossing faster; however, once they reach a certain level of success, they will not get any faster without a system redesign. In fact, they may even get slower if they get sloppy and toss the bear outside the circle or drop it in their attempt to go faster. This part of the activity models the concept of "limits to success".
9. If students ask if they can do the activity differently, just repeat the 2 rules above.
10. Continue until students figure out how to redesign the system to achieve the desired goal. There are several redesigns that will accomplish the task much faster, such as standing next to each other and passing the bear along the line, or lining their hands up vertically in the correct order and cascading the bear down the vertical line.
11. Conclude with the following reflection questions.

Assessment
Reflection Questions

For Intermediate and Advanced Students

- What happened the first few times through? Did you succeed in doing it faster? Why?
- Was there anyone who thought about other ways of doing it but did not speak up? What kept that person from offering a solution?
- Did anyone offer a solution that was ignored? Why was their solution ignored?

For Advanced Students

- What were the assumptions in the activity and how did these assumptions limit your ability to achieve your goal (there might have been some assumptions that there were unstated rules about how the activity could be done)?
- What are some examples of real-world situations in which people experience the limits to success by doing something harder and faster? What are the assumptions associated with how that system functions, and how could that system be redesigned to achieve a common goal?

Bears in the Air

Action Projects

- Have students choose a "system" that they think is not working well. This could be something going on at home, in their school, in their community, or in the larger world. Have them analyze and write about the system using the *Bears in the Air* activity as a model. They should identify and explore the system's goals, assumptions, mental models, limits to success, and possible redesigns.

Additional Resources

Books

- *The Lorax*, Dr. Seuss, Random House, 1971. This children's story about the wise Lorax who warns the Once-ler not to cut down all the Truffula trees models several systems thinking concepts, including interconnectedness, limits to success, and unintended consequences.

Websites

- **www.thesystemsthinker.com** - Newsletter of Pegasus Communications, an organization that provides resources to help individuals, teams, and organizations understand and address the challenges they face in managing the complexities of a changing world.