

**Centrifugal Force and Mandy Sue Day**  
**4<sup>th</sup> Grade**  
**Kelly Denney and Mrs. Skopin**

**References:**

- Karim, Roberta. *Mandy Sue Day*, printed in Signatures; Harcourt Brace: Orlando, 1999.
- CAPtivating Science, part of Ohio Statewide Science Workshop; COSI: Ohio's center of Science and Industry, 1996.

**Benchmarks:**

SLC/GLI #: 4<sup>th</sup> grade: PS-4.

**Objectives:**

This lesson is a fun, interactive lesson to follow along with the story, Mandy Sue Day, which is part of the 4<sup>th</sup> grade reading curriculum. Centrifugal force is mentioned in this book, and as integrating science across the curriculum is one aim of the Columbus School District, Mrs. Skopin and I thought this would be a good way to do that. Other objectives of the lesson involve helping students understand what a force is and teaching them to be aware of centrifugal force, since it is one that they invariably experience nearly every day of their life. Thus, this lesson is great at helping students become aware of the continued presence of science in the common surroundings of every-day life. Finally, it is also the objective of this lesson to help students learn analytic thinking and the scientific method of asking a question, conducting an experiment, and making observations to try to answer the question.

This lesson will begin with the demonstration of centrifugal force that was used in Mandy Sue Day. The students will then get to experiment with same idea on a smaller scale, using bottle caps and confetti, instead of a bucket and water. Next, the students will get a chance to feel centrifugal force for themselves, either on the merry-go-round or with a partner, spinning in circles, discussing safety first. We will then discuss what they felt while doing this and ask some of the same questions as with the bottles caps, such as whether the speed matters. Finally, we will talk at a basic level about what forces are and that what they are experiencing is centrifugal force, just like the water in the bucket.

**Materials:**

- Bucket and rope
- Bottle caps
- String
- Scissors
- Tape
- Water
- Confetti