Refraction is an online puzzle game for teaching fractions. The game is not obviously a lesson in fractions, but requires knowledge of fractions to succeed. In Refraction, the player must partition lasers in order to power spaceships containing various animals that have gotten stuck in space. These animal spaceships all require different fractions of the lasers, and the player is given several pieces that split and bend the lasers to reach the animals and satisfy these requirements. These mechanics can be used to teach many important fraction concepts, such as equal partitioning, addition, multiplication, mixed numbers, improper fractions, and common denominators. The game itself is instrumented so that it records everything the player does, allowing teachers and researchers to analyze play data.

Refraction runs in the browser, using Adobe Flash Player. The game is a research project in progress, so we'll continue to update the game over time. You can play the game at: http://games.cs.washington.edu/refraction

Principal Investigator: Zoran Popović
Project Directors: Erik Andersen, Yun-En Liu, Eric Butler, Zoran Popović
Art Directors: Marianne Lee, Brian Britigan
Programming: Erik Andersen, Yun-En Liu, Eric Butler, Stephen Sievers, Roy Szeto, Mai Dang, Christian Lee, Ethan Apter, Emma Lynch, Justin Irwen
Graphic Art: Marianne Lee, Brian Britigan, Happy Dong
Game Concept and Design: Seth Cooper, Erik Andersen
Learning and Game Design Experts: François Boucher-Genesse, Carmen Petrick, Taylor Martin