

Beanbag Toss

Learning Goals

Grade Band	3 – 5
Possible Math Tools	<ul style="list-style-type: none">• Addition• Division• Percentages
Real-World Context	<p>Students divide into groups, and each group designs a beanbag toss game. The game must be fair enough to attract players, and challenging enough to keep them invested. Students use the resources at their disposal to design a carnival game, and use data to set an appropriate level of challenge by changing player accuracy. Students may brainstorm one of many different modeling problems:</p> <ul style="list-style-type: none">• How big should the target be?• How far should a player stand from the target?• What kind of obstacles should be in the way?
Cross-Curricular Connections	<p>This lesson could be inspired by a field trip or icebreaking game; for example, students might create a carnival stand as a crafts project, and then consider how to improve their game.</p>

Relevant Common Core Standards:

CCSS.MATH.CONTENT.3.NF.A.1

Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.

Task: Measure the height of an obstacle between the target and thrower with a fractional measuring tool.

CCSS.MATH.CONTENT.3.MD.B.4

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

Task: Measure the height of an obstacle in between the target and thrower and compare heights with a graph.

CCSS.MATH.CONTENT.3.MD.C.5

Recognize area as an attribute of plane figures and understand concepts of area measurement.

Task: Determine how large a target should be to make the game challenging but not impossible.

CCSS.MATH.CONTENT.4.NF.C.6

Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*

Task: Convert the fractional height of an obstacle into a decimal that is easier to compare with other heights. Is $5/16$ larger than $3/7$?