

## What Is 6 Feet? Estimation Activities for Elementary School

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## Engineers need to be good at performing estimations!

Engineers need to be able to estimate to determine if a calculated answer is reasonable, but chances for students to practice estimation to evaluate their calculations are uncommon [1].

Estimation can help students learn the connection between the mathematical formulas they use in class and the real-world applications around them [2].

### References:

[1] Raviv, D., & Harris, A. J. (2016, June), *Estimation as an Essential Skill in Entrepreneurial Thinking* Paper presented at 2016 ASEE Annual Conference & Exposition, New Orleans, Louisiana. 10.18260/p.26739

[2] Bourn, R., & Baxter, S. C. (2013, June), *Developing Mathematical Intuition by Building Estimation Skills* Paper presented at 2013 ASEE Annual Conference & Exposition, Atlanta, Georgia. 10.18260/1-2—19419.

## Estimation Activities for Elementary School (Resource Exchange)

# What is 6 feet?



In-Person / Online / Hybrid

## Overview

*Objective: to help 3rd and 4th grade students practice their estimation skills through relevant activities.*

Using objects around a classroom or at home, students practice estimating distances (6 feet and other distances), area, volume, weight, and temperature. Students practice techniques to estimate (i.e., how many steps or lengths of my arms are needed for 6 feet). This activity works in-person with social distancing or online. The lesson materials are all inclusive: worksheets, other ways to practice estimation, teacher scripts, videos for the students, FAQs, and additional outside resources.



## Introduction

### Grade Level Recommendation: 3<sup>rd</sup>-4<sup>th</sup> Grade

*During the recent pandemic, kids heard “6 feet” over and over again. This hands-on activity is designed to be relevant and familiar to students with the flexibility to be done in any instructional mode: in-person, online, or hybrid. Using everyday items, students practice measuring and estimating. Each lesson activity takes approximately 15-20 minutes.*

What is 6 feet? How big is 6 feet? How do I spread students out inside a classroom so everyone stays at least 6 feet apart?

One technique used to estimate distances is by using known, premeasured or “standard” object lengths or widths.

### Did you know

- That the span of your arms from fingertip to fingertip are approximately the same as your height?
- Most doorways are 80 inches tall.
- Loose-leaf paper is 8.5 inches by 11 inches.
- Your desk is approximately 28-30 inches in height.
- The length and width of a 1 x 1 Lego brick is 8 mm.
- Your school flooring tiles are likely 1ft by 1ft.

Being able to estimate is an important skill. It allows students to determine if their answers are reasonable in everyday life.

- Size / Distance
- Area
- Volume
- Weight / Mass
- Temperature

The supplied activities cover five different types of measurement and estimation: size / distance, area, volume, weight/mass, and temperature. The activities are standalone and take approximately 15-20 minutes for the students to complete.

### Activities Provided:

- What is 6 feet? (Estimating large distances)
- What is the size of a Lego? (Estimating small distances and area)
- How much does my juice box hold? (Estimating volume)
- How much does a gallon of milk weigh? (Estimating weight)
- How cold is the fridge? (Estimating temperature)

# Example Activity: Estimating Distance

*This activity begins by having the students “guess” a distance of 6 feet (or 1.82 meters). They should place two objects (i.e., “markers”) at what they believe is 6 feet apart. Students should discuss in small groups why they think it is 6 feet.*

1: Using tape measures, yard/metersticks, or rulers, have the students measure their “6 feet”. (You could make a little competition out of this part for whichever group is the closest). As a class discuss how accurate or inaccurate their measurements were.

2: Individually, brainstorm objects (i.e., write down 3-4) that are “standard” around your classroom (or home). A standard object refers to something whose size is known. Examples: sheet of paper, the length of your feet, the length from your wrist to elbow.

3: Discuss in small groups, select the “best” standards, and create a list. Try to have one object from each student’s list.

4: As a whole class, have each group share their list and why they selected those objects.

5: Then, the teacher shares standards that the students might not have thought of (e.g., like their height being approximately the length fingertip to fingertip).

6: Have the students measure their height vs. the distance from fingertip to fingertip.

7: Have the students measure other standard objects to produce more accurate estimations. Using these standard objects, you can estimate the distance or length / width of other objects. For example: if you know the measurement of your foot, you could step out a distance.

8: Have the students put down/away the tape measures. The teacher then should reveal various objects (a favorite classroom storybook or the length of the chalkboard) or distances that they want the students to measure (the distance from the door to the teacher’s desk). Have the students estimate these distances.

9: Students should measure these same items with their tape measures to see how close they came. Calculate the difference.

10 (optional): Brainstorm ways to improve accuracy. Estimate and measure various items to test ideas.

11 (optional): Answer any questions. Wrap up the activity with reminders on the lessons by asking questions. Review vocabulary introduced.

## Purpose

Provides 15-20 minute fun, hands-on, active learning activities on estimation and measurements for 3<sup>rd</sup> and 4<sup>th</sup> grade teachers to add to their existing curriculum or for outreach practitioners to bring into classrooms they visit.

## Common Core Standards Covered

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### 3<sup>rd</sup> Grade

CCSS.Math.Content.3.MD.A.2 “Measure and estimate liquid volumes and masses of objects using standard units of grams(g), kilograms (kg), and liters(l).” [3]

CCSS.Math.Content.3.MD.C.5 “Recognize area as an attribute of plane figures and understand concepts of area measurement.” [3]

### 4<sup>th</sup> Grade

CCSS.Math.Content.4.MD.A.1 “Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec.” [4]

get the materials / references / ask the authors >>>

**Q:** Where are these materials?

**A:** <https://tinyurl.com/5c59nzvv>

References: <https://tinyurl.com/hbd3a8vs>



SCAN ME

[3] National Governors Association Center for Best Practices, Council of Chief State School Officers. “Common Core State Mathematic Standards: Grade 3 Measurements and Data.” National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C., 2010. Website: <http://www.corestandards.org/Math/Content/3/MD/> (Accessed: May 30, 2021)

[4] National Governors Association Center for Best Practices, Council of Chief State School Officers. “Common Core State Mathematic Standards: Grade 4 Measurements and Data.” National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C., 2010. Website: <http://www.corestandards.org/Math/Content/4/MD/> (Accessed: May 30, 2021)

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