

DMT INSTITUTE

Developing Mathematical Thinking Institute (DMTI)



Professional
Development



Curricular
Resources



Assessment

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About the DMTI Targeted Activities

These DMTI Targeted Activities modules are designed to be played or completed with a partner or in small groups. These supplement the Intermediate Math Assessment and DMTI curricular materials.

The activities are intended for teachers or caregivers to play with children to build necessary math skills and math language. Each activity can be played for 10 to 20 minutes. Each additional activity in the module advances in difficulty.

IMA – Grade 3 - 6

Fraction Concepts

Fraction Concepts

What's involved:

- Seeing the relationship to one with various fractional units
- Iterating and partitioning units of one and fractional amounts
- Understanding similarities and differences with equivalent amounts
- Comparing fractions
- Understanding the relationship between quantities

Why it matters:

- Reinforces measurement concepts
- Helps students make sense of multiplicative situations which supports their ability to reason proportionally
- Builds foundational concepts for algebra and functions
- Connects to real-life situations from cooking to building to engineering

Fraction Concepts: Building Fractions

Materials

- Journal or Paper
- Worksheets [Printout]
- Dice [DMTI Math Pack]

Here are four useful dice for this activity: 4, 6, and 10-faced dice. We will be using all of them and will suggest ways to simplify or extend the activity.



Fraction Concepts: Building Fractions

Warmup – Fraction Description

Here are a few things we should know about fractions.

- Think about the fraction $\frac{1}{2}$. A fraction is a special kind of number that describes the space between whole numbers (e.g. 0 to 1, 1 to 2).
- The way we write a fraction is very important as each digit tells us something about the number.
- The bottom digit of a fraction is called the **denominator** and the top digit of a fraction is called the **numerator**. To understand fractions it is often best to look at the denominator (bottom digit) first. Here is what the different digits of a fraction mean:

Numerator
Denominator

How many of the units I am counting in do I have?
How many units (pieces) will it take to make 1?

Units counted
Units to make 1 or Unit size

Fraction Concepts: Building Fractions

Warmup – Fraction Description

Numerator
Denominator

How many of the units I am counting in do I have?
How many units (pieces) will it take to make 1?

Units counted
Units to make 1 or Unit size

- Based on these descriptions, discuss with a partner what the fraction $\frac{1}{2}$ means. *Use as many of the words above.*
- Use the words above to describe $\frac{2}{2}$. What about $\frac{3}{2}$?
- And try it again to describe $\frac{3}{4}$, $\frac{4}{4}$, and $\frac{9}{4}$.

Partner Activity Example Statements

Discuss with a partner	Example Descriptions
Based on these descriptions, what does the fraction $\frac{1}{2}$ mean?	<i>“It takes 2 ($\frac{1}{2}$ units) to compose 1 and we have counted only 1 of these $\frac{1}{2}$ units.”</i>
What about $\frac{2}{2}$?	<i>“It takes 2 ($\frac{1}{2}$ units) to compose 1 and we have counted 2 of these $\frac{1}{2}$ units. That means $\frac{2}{2}$ is the same as 1.”</i>
What about $\frac{3}{2}$?	<i>“It takes 2 ($\frac{1}{2}$ units) to compose 1 and we have counted 3 of these $\frac{1}{2}$ units. That means $\frac{3}{2}$ is more than 1.”</i>

Partner Activity Example Statements

Discuss with a partner	Example Descriptions
Based on these descriptions, what does the fraction $\frac{3}{4}$ mean?	<i>“It takes 4 ($\frac{1}{4}$ units) to compose 1 and we have counted 3 of these $\frac{1}{4}$ units.”</i>
What about $\frac{4}{4}$?	<i>“It takes 4 ($\frac{1}{4}$ units) to compose 1 and we have counted 4 of these $\frac{1}{4}$ units. That means $\frac{4}{4}$ is the same as 1.”</i>
What about $\frac{9}{4}$?	<i>“It takes 4 ($\frac{1}{4}$ units) to compose 1 and we have counted 9 of these $\frac{1}{4}$ units. That means $\frac{9}{4}$ is more than 2.”</i>

Building Fractions

Fraction Concepts: Building Fractions

Activity 1

Directions

- A. Roll two dice (use two 4-faced dice and then the 4-faced and 6-faced dice).
- B. The first die is the denominator or unit size. Draw a number line from 0 to 1 and partition the number line correctly.
- C. The second die is the numerator. Extend the number line if needed and bold or shade the number line to represent the count.
- D. State how much you have using the sentence frame: I have a count of ___ units of size ___ or ___.

Fraction Concepts: Building Fractions

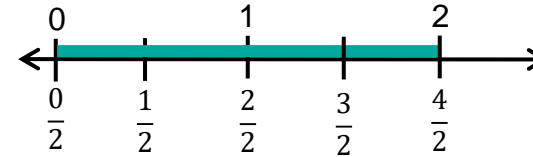
Example



The first die is the denominator. It is a 2.



Second die is the numerator or count. It is a 4.



I have a count of 4 units of size $\frac{1}{2}$ or $\frac{4}{2}$ or 2.

Now complete Worksheet 1.1

Worksheet 1.1

- A. Roll two dice.
- B. The first die is the denominator or unit size. Draw a number line from 0 to 1 and partition the number line correctly.
- C. The second die is the numerator. Extend the number line if needed and bold or shade the number line to represent the count.
- D. State how much you have using the sentence frame: I have a count of ___ units of size ___ or ___.

First Die (Denominator)	Second Die (Numerator)	Number Line	Sentence

Fraction Concepts: Building Fractions

Activity 2

Directions

- A. Roll two dice (use two 8-faced dice and 10-faced dice)
- B. The first die is denominator or unit size. Draw a number line from 0 to 1 and partition the number line correctly.
- C. The second die the numerator. Extend the number line if needed and bold or shade the number line to represent the count.
- D. State how much you have using the sentence frame: I have a count of ___ units of size ___ or ___.

Fraction Concepts: Building Fractions

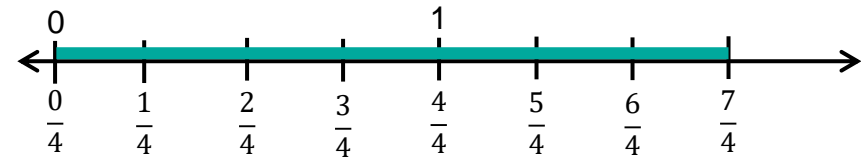
Example



The first die is the denominator. It is a 4.



Second die is the numerator or count. It is a 7.



I have a count of 7 units of size $\frac{1}{4}$ or $\frac{7}{4}$.

Now complete Worksheet 2.1

Worksheet 2.1

- A. Roll two dice.
- B. The first die is the denominator or unit size. Draw a number line from 0 to 1 and partition the number line correctly.
- C. The second die is the numerator. Extend the number line if needed and bold or shade the number line to represent the count.
- D. State how much you have using the sentence frame: I have a count of ___ units of size ___ or ___.

First Die (Denominator)	Second Die (Numerator)	Number Line	Sentence



“The Developing Mathematical Thinking Institute (DMTI) is dedicated to enhancing students’ learning of mathematics by supporting educators in the implementation of research-based instructional strategies through high-quality professional development, curricular resources and assessments.”

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