

Lesson 18: Design With Fractions (Optional)

Standards Alignments

Building On 3.NF.A.1, 3.NF.A.2.a

Addressing 3.NF.A.2

Teacher-facing Learning Goals

- Apply fraction understanding to create geometric designs.

Student-facing Learning Goals

- Let's use fractions to create a design.

Lesson Purpose

The purpose of this lesson is for students to apply their understanding of fractions to create geometric designs.

This lesson is optional because it does not address any new mathematical content standards. It does provide students with an opportunity to apply precursor skills of mathematical modeling.

In this lesson, students apply their understanding of fractions to create geometric designs, starting with a given square. They are tasked with marking a fractional length ($\frac{1}{2}$ or $\frac{1}{4}$) of each side of the square with a point. They then connect the points, which creates a new shape within the square. Students iterate this process of marking a fractional length and connecting points to generate their designs.

To mark a given length, students apply their experience with partitioning a segment into equal parts. To mark a fractional length, they decide which endpoint of each side to use as a starting point, whether to always mark the points in the same direction (clockwise or counterclockwise), how many iterations are practical, and so on (MP4).

Access for:

Students with Disabilities

- Representation (Activity 1)

English Learners

- MLR2 (Activity 1)

Instructional Routines

Notice and Wonder (Warm-up)

Materials to Gather

- Paper: Activity 1, Activity 2
- Rulers or straightedges: Activity 1, Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	25 min
Lesson Synthesis	10 min

Teacher Reflection Question

How did the student work that you selected impact the direction of the discussion? What student work might you pick next time if you taught the lesson again?