Frac and Field

Objectives

- To write fractions as part of a whole
- To instill the idea of less than and greater than when observing fractions
- To establish a foundation for adding and subtracting fractions
- To understand the concept of a fraction on a number line

Common Core Standards

3.NF.1	Understand a fraction 1/*b* as the quantity formed by 1 part when the whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by *a* parts of size 1/*b*.
3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram.
4.NF.2	Compare two fractions with different numerators and different denominators.
4.NF.3a.	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

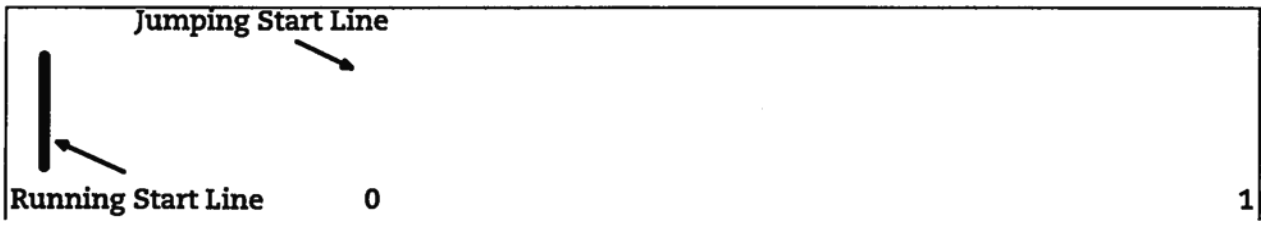
Materials

- Sidewalk chalk (outside)
- Painter's tape, 2 different colors (inside)
- Measuring tape
- Paper
- Pencil
- Paper Plates
- String or cord
- *Frac and Field* Records Sheet

Set-Up

Long Jump (Indoor directions are indicated. Outdoors, use sidewalk chalk to make lines.):

- **Making the number line:** Find an unobstructed location with minimal dimensions 30 ft by 6 ft.



- On the floor, mark the following lines (see diagram above):
  - A 2-ft length of tape to mark a starting line for running that will be used to measure the length of learners' jumps.
  - A 16-ft length of cord or tape. This is the number line that will be used to measure the length of learners' jumps.
  - A 2-ft length of tape at the 0-ft line and perpendicular to the number line to indicate the starting line for learners' jumps.
  - Place tick marks every 2 feet along the number line. Label the numbers 0 and 1 using sticky notes.

Important note: when students count the number of "lines" they have jumped, many start counting at the jumping start line. This line should **not be counted. Use a different colored tape to alert students that the jumping line represents 0.

Triple Jump:

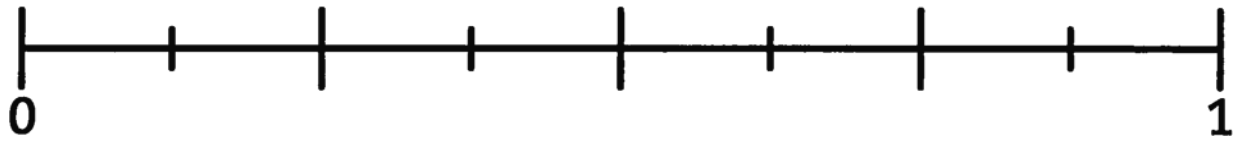
- Create another number line as above, this time the line must have a length of 24 feet.
- For small groups, extend the number line used for long jump. For larger groups, use different lines for each event.

Discus Throw:

- Use a 2-ft length of tape to denote a starting line.
- Knot a 32-ft length of string every 4 feet to section it into 8 equal pieces. The string will be used to measure the length of each learner's discus throw.
- Use a small paper plate or a small pie tin as the discus.

Launch:

- As learners get ready to participate in each event, talk with them about the Olympic, National, and high school records for each event.
- Show students a number line from 0 to 1 (see below). Ask "What fractions can be represented by each number mark? How do you know?"



Explore:

- Arrange students into groups of 2 or 3, so there are no more than 6 groups.

On Your Turn:

Long Jump

- The unit or whole that you will use to measure your jump is the length of the number line. The number 0 is represented by the Jumping Start Line and 1 is represented by the end of the number line 16 feet away from the Jumping Start Line.
- Start running at the Running Start Line. Jump once starting at the Jumping Start Line.
- Find the closest tick mark to the place you have landed and assign that place a fraction. For example, if you land on the 3rd mark, you have jumped 3/8 of the way from 0 to 1.
- Jump two more times and record your score each time on the record sheet provided.

Triple Jump

- The unit, 1, is represented by the end of the number line at a position 24 feet from the Jumping Start Line.
- Use the same process you did for the long jump, except you will jump three times in succession.

- In your group of 3, the other two students will use chalk or tape to make a mark where you land on each of your first two jumps. So for each triple jump, you will have jumped three times in one try.
- On the record sheet, record each of your jumps as a fraction of the full length of the Triple Jump number line. You will record three fractions for each triple jump.
- Perform this activity twice more.

Discus Throw

- The unit is represented by the full length of the cord. The number 0 represents the starting line and 1 represents the opposite end of the string, 32 feet away. Attach the 0 end of the measuring string to the center of the starting line.
- Standing at the starting line, throw a small paper plate.
- Walk the measuring string out to the place where your plate landed. If the plate goes farther than the string allows you to measure, stretch out the string as straight as it will go, and tape down the end representing 1. Disengage the 0 end of the string and continue measuring from where you left off. Your fraction will be greater than 1.
- Record the fraction representing where you plate landed on your record sheet.
- Repeat twice more.

Extensions

For each event, students will answer the following questions. These questions will also be highlighted on their score sheet.

1. Who jumped/threw the farthest in your group? How do you know?
2. What fraction of the middle school record was your longest jump/throw?
3. What fraction of the middle school record was your shortest jump/throw?
4. What fraction of the middle school record was the sum of all your long jumps/discus throws?
5. What fraction is the sum of your three long jumps? Can you compare this number to the fraction representing your longest triple jump? Why or why not?

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Event Records Sheet

	Olympic	*Country*	*Year*	*Athlete*
Long Jump	8.90 m	United States	1968	Bob Beamon
Triple Jump	18.09 m	United States	1996	Kenny Harrison
Discus Throw	72.30 m	East Germany	1988	Martina Hellman

	US	*Team*	*Year*	*Athlete*
Long Jump	8.95 m	USA National	1991	Mike Powell
Triple Jump	18.09 m	USA National	1996	Kenny Harrison
Discus Throw	71.32 m	Southern California Striders	1983	Ben Plucknett

	High School	*Location*	*Year*	*Athlete*
Long Jump	8.18 m	Rowlett, Texas	2009	Marquise Goodwin
Triple Jump	16.72 m	Baton Rouge, Louisiana	2004	Kenny Hall
Discus Throw	61.38 m	Fort Wayne, Indiana	1990	Gregg Hart

Discovering STEM Program

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