

Frac and Field



Strands:

| | |
|--------------------------|---|
| Number & Quantity | X |
| Algebra | |
| Functions | |
| Geometry | |
| Statistics & Probability | X |

Materials Needed:

- *Frac and Field* Leaderboard
- Cord or string
- Painters tape (indoors), or chalk (outdoors)
- Meter or yard stick, measuring tape
- Jar lid (something to throw)

Where:

| | |
|---------|---|
| Outside | X |
| Inside | X |
| On-line | |
| On-site | |

Compare your athletic prowess to that of recent record holders your age. Explore and represent fractions while you're at it!

Set-Up:

- Create each event space:
 - **Long Jump:** The Junior Olympic record for 9 to 10-year-old boys is 16 ft 3.75 inches. For the same age group, the girls' record is 12 ft 3 inches. Use cord or string to create a number line measuring 16 feet. Mark off every two feet with chalk (outdoors) or a painter's tape (indoors). Mark the starting line and a runway clearly.
 - **Triple Jump:** The Junior Olympic record for 13 to 14-year-old boys is 43 ft 3.25 inches. For the same age group, the girls' record is 40 ft 1 inch. Use a distance half this length for this game. Create a 22-foot number line (with cord and chalk or tape). Mark off every 2 feet. Mark the starting line and a runway clearly.
 - **Discus Throw:** The Junior Olympic record for 11 to 12-year-old boys is 133 ft 10 inches. The middle school girls' record is 122 ft 10 inches. We are using a measuring tool 32 feet long because our *discus* is lighter. Use tape to denote a starting line. Prepare a string to use to measure the length of the throw. The string should be 32 feet long with a knot tied in the string every 4 feet to divide the string into 8 equal sections.
- Create a team of three. Each team member is assigned a role: athlete, measurer, or recorder. Team members rotate roles each event until each member has completed each role.

Pre-Game Play: Each team member tries each event at least once. Use your results to determine the athlete on your team for each event. Remember, all three team members need to be an athlete for one event.

Object of the Game: Understand a fraction as a number on a number line and as part of a whole. Interpret fractions in context.

Playing the Game:

1. **Long Jump:**
 - a. The athlete takes a running start and jumps as far as possible beginning at the starting line.
 - b. The measurer watches the athlete closely, then locates and marks the place the athlete landed.
 - c. The recorder works with the measurer to assign that location a fraction. For example, if the measurer marks the athlete's jump on the 3rd mark, the recorder and measurer determine that the athlete has jumped $\frac{3}{8}$ of the way from 0 to 1. The recorder writes this distance on the leaderboard. Note that this distance is $\frac{3}{8}$ of the 9 to 10-year-old boy's Junior Olympic long jump record.
 - d. If the team correctly identifies the fraction on the number line, the team receives a point.
2. **Triple Jump:** Follow the same process as for the long jump, except the athlete jumps three times in succession, landing one foot at a time.
3. **Discus Throw:**
 - a. Standing at the starting line, the athlete throws a small jar lid, the *discus*, as far as possible.
 - b. The measurer watches closely and uses the knots on the cord to measure the fraction of the full length of the cord the athlete threw the *discus*.

- c. If the *discus* travels farther than the string is long, the measurer holds the cord to the farthest distance it can reach and continues measuring with the same cord. (Note that the fraction is greater than 1.)
 - d. The recorder works with the measurer to determine the fraction associated with the distance the *discus* flew.
 - e. Score as in the long jump.
4. **Scoring:** Add the points earned by the team for each event.

Winning the Game: The team with the highest score wins!

Think About It:



5. For the long jump, what fraction of the 9 to 10-year-old boys' record was your jump?
6. For the triple jump, what fraction of 13 to 14-year-old boys' Junior Olympic record was your triple jump?
7. For the *discus* throw, what fraction of the cord length did you throw?

Variations:

Score More: If a team member determines what fraction more the athlete would have to jump or throw to equal the boys' record provided, the team scores an additional point.

Leaderboard: Record the fractions for each athlete and each event on one sheet, the *Leaderboard*. Compare fractions and arrange them in order, smallest to largest. Award each team points for taking first (3 points), second (2 points), or third (1 point) place.

Change the Unit: Look up the Junior Olympics records for your age group; choose which gender's record to use. Round the record to the nearest whole number. Change the length of the cord to be this number. The unit is the full length of the cord. Repeat the game.

Helpful Hints:

- Remember that the full length of each line represents one whole.
- Count the number of sections in each cord. What fractions can you easily name from the sections?
- Teams earn the most points through accurately naming fractions. Don't forget to collaborate and share strategies.
- If a player is just learning fractions, the measurer and recorder choose the closest fraction mark to which the athlete landed or threw.
- If a player has more experience with fractions, the measurer and recorder can estimate the distance jumped or thrown to be more accurate than one of the two fraction marks closest to the distance the measurer marked.