

# Teaching Math: A Video Library, 5-8

## Fraction Tracks

### Video Overview

Hilory Paster explains the "Fraction Tracks" game to her fifth–grade class. Students draw fraction cards from a deck and move markers on their game boards, trying to get them all from zero to one. In the game, students often have to rename the fraction they draw as the sum of two or more fractions. They also use equivalent fractions.

Ms. Paster walks around the room as the students play, helping them when they get stuck and asking them questions. At the end of the lesson, students share strategies they used in the game.

Prior to this lesson, students studied fractions and equivalent fractions. They made giant fraction number lines that are posted around the room.

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### An Exploration for Teacher Workshops

*Materials:* fraction tracks (below), dice or number cubes, six markers per pair

Work in pairs to play—for at least a few turns—a version of the fraction tracks game. The rules are in the box at left.

### Some Questions

1. When do you have to use equivalent fractions?
  2. In what situations can't you move? What would be a good rule to use for such a situation?
  3. What other techniques could you use to generate fractions?
  4. This game has no tenths (the one in the video does). Does that create any problems? Are there advantages or disadvantages to having tenths?
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## **Additional Discussion Topics**

Here are some additional ideas for discussion that arise in the video:

- Some students might use the fraction track sheet itself to find equivalent fractions. Is that a crutch or a path to understanding?
- How does Ms. Paster interact with the students? What questioning strategies does she use?
- Discuss the role of correct mathematical terminology and how Ms. Paster does or does not encourage its use in this video.

## **Assessment**

- How does Ms. Paster check for understanding as she moves around the room?
  - Discuss the role of student presentations from an assessment point of view.
  - During presentations, Ms. Paster sometimes has students rephrase each others' explanations. She says that having students rephrase others' statements acts "as an assessment for myself." What do you suppose she means by that?
  - Students were asked to write "two to three possible moves" for each turn on their strategy sheets. Can you use these sheets as assessment tools? What could you learn from them? What is another kind of recording you might have students do as an assessment?
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## Discussion Questions

These questions appear at the end of the video. Here are some follow-up ideas and prompts to help get a discussion going.

### **What are the pros and cons of using cooperative games?**

There are really two issues to consider: using games at all, and whether to use cooperative, rather than competitive games.

First, the games: Ms. Paster used an entire period playing this game and discussing it. She could have done a more traditional lesson with more structure and practice. Was the game worth that much time? When are games appropriate? Did Ms. Paster learn anything about her students she would not have learned otherwise? Do games help all students equally?

Second, cooperation: You could play the fraction track game with the goal of being the first to get your pieces to 1. Some teachers say that competition, carefully managed, gives students additional motivation. What do you think?

### **How do materials such as fraction pieces enhance student understanding?**

At one point, some students used fraction pieces to find fractions that add up to  $\frac{7}{8}$ . Later, some students studied  $\frac{9}{10}$  using fraction pieces. What specifically do fraction pieces help students to understand? Did you have any insights about fractions (or students) watching the segments with fraction pieces?

These students knew the fraction pieces were available in the room and decided on their own to use them. Discuss management strategies for open access to materials.

### **How could this lesson be extended?**

One way to generate extensions is to vary elements in the activity. What if you used different denominators? Different cards? Decimals and percents on the cards? Decimals on the number lines? Describe how you would use each extension. Can you think of extensions to make the activity simpler or easier?

Ms. Paster planned to play the game again with a number line that extended from 0 to 2. Is that a significant extension? From what you know about students learning fractions, what additional problems will they face? What else will they learn?